

MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The MONTHLY WEATHER REVIEW for November, 1898, is based on about 2,762 reports from stations occupied by regular and voluntary observers, classified as follows: 162 from Weather Bureau stations; numerous special river stations; 32 from post surgeons, received through the Surgeon General, United States Army; 2,385 from voluntary observers; 96 received through the Southern Pacific Railway Company; 29 from Life-Saving stations, received through the Superintendent United States Life-Saving Service; 31 from Canadian stations; 10 from Mexican stations; 7 from Jamaica, W. I. International simultaneous observations are received from a few stations and used, together with trustworthy newspaper extracts and special reports.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. Curtis J. Lyons, Meteorologist to the Hawaiian Government Survey, Honolulu; Dr. Mariano Bárcena, Director of the Central Meteorological and Magnetic Observatory of Mexico; Mr. Maxwell Hall, Government Meteorologist, Kingston, Jamaica; Capt. S. I. Kim-

ball, Superintendent of the United States Life-Saving Service; and Commander J. E. Craig, Hydrographer, United States Navy.

The REVIEW is prepared under the general editorial supervision of Prof. Cleveland Abbe.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the REVIEW, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to generally conform to the modern international system of standard meridians, one hour apart, beginning with Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are sometimes corrected to agree with the eastern standard; otherwise, the local meridian is mentioned.

FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

One of the most disastrous storms of recent years visited the Middle Atlantic and New England States November 26-27, 1898. At least 200 lives were lost, and fully 100 vessels wrecked along the New England coast, and railway traffic was blocked by snow. A description of this storm, together with charts which present the general weather conditions over the eastern half of the United States at 8 a. m., noon, and 3 and 8 p. m. of November 26, and 8 a. m. and 8 p. m. November 27, appears in this issue of the REVIEW. (See charts X, XI, and XII.) The action of the Weather Bureau in warning maritime and other interests of the approach of the storm is also indicated.

The Lake region and middle and north Atlantic coasts were visited by several storms of unusual severity. The first of these crossed from the upper Lakes to the St. Lawrence Valley during the 1st and 2d. From the 4th to the 6th a storm moved from the British Northwest Territory to the St. Lawrence Valley, attended by very strong south to west gales over Lakes Michigan, Erie, and Ontario. The highest velocity of the month at Chicago, 76 miles from the south, on the 7th, attended the passage of a storm center from Lake Superior to the St. Lawrence Valley during the 7th and 8th. On the 9th and 10th a disturbance advanced from Texas to western New York, and thence to Nova Scotia by the morning of the 11th, causing northeast to northwest gales of 50 to 60 miles

an hour over southern Lake Michigan, and correspondingly high velocities from the north and northwest on the lower Lakes and along the New York and south New England coasts. On the 18th a storm appeared over Manitoba and passed thence to the New Jersey coast by the morning of the 19th, and during the 19th and 20th caused wind velocities, mostly from west to northwest, of 50 to 60 miles an hour from Hatteras to New York.

From the 18th to the 23d a storm crossed the continent from the north Pacific coast to Nova Scotia, and on the 21st and 22d caused gales of over 50 miles an hour in the Lake region. The passage of this storm was followed by the principal cold wave of the month, which carried the line of freezing temperature to the middle Gulf and south Atlantic coasts. In no instance did sections visited by these storms fail to receive early and ample warning of their approach.

THE NORTH ATLANTIC COAST STORM OF NOVEMBER 26-27, 1898.

The records of the Weather Bureau show that disturbances of the class to which this storm belongs have caused some of the severest northeast-gales and the heaviest falls of snow experienced in New York and New England. A well-remem-

bered storm of this general class occurred in March, 1888, when the force of the wind along the middle Atlantic and New England coasts was almost unprecedented, and a snow blockade continued several days over a great portion of New York and New England.

A distinctive feature of these storms is found in the fact that a development of destructive strength begins with a union at some point off the middle Atlantic or south New England coasts of two storms, one from the west or northwest, and the other from the south Atlantic coast.

In the case of the storm now under consideration the charts X, XI, and XII show that on the morning of November 26 a storm center occupied lower Michigan, and an area of high barometer covered New England. A closer scrutiny of the reports will show evidence of a cyclonic wind circulation along the south Atlantic coast. At noon of the 26th, four hours later, the Michigan storm center had advanced to Pittsburg, Pa., and the southern storm had deepened rapidly and moved to a position off Hatteras, N. C. By 3 p. m. the centers had united off Norfolk, Va., and by the 8 p. m. report the center of disturbance had deepened and was located off the New Jersey coast. The path of the storm center during the next twelve hours is traced to a point near Cape Cod, where the barometer read 29.30 inches, or slightly below, and the greatest storm intensity was shown. Passing northeastward the center of disturbance reached Nova Scotia the night of the 27th.

That these movements and the subsequent severe development of the storm were anticipated is shown by the following storm-signal orders and special snow warnings which were telegraphed to maritime, commercial, and traffic interests throughout New York and New England at 10:30 a. m. of the 26th, when the weather conditions in those regions were serene.

Northeast storm signals were ordered along the New England coast from Newport to Eastport, with the following advisory message:

Storm central near Detroit moving east. East to northeast gales with heavy snow to-night. Wind will shift to west and northwest with much colder Sunday.

Southeast storm signals were ordered at Sandy Hook, New York, New Haven, and Montauk Point, with the following message:

Storm central near Detroit moving east. Wind will increase to south and southeast gales this afternoon and shift to west to-night, with snow. Decidedly colder Sunday.

Storm signals were also displayed along the Atlantic coast as far south as Norfolk, with additional warning of snow or rain, and the storm warnings for the lower Lakes included a warning of snow and a cold wave. The Bureau of Navigation, Navy Department, and the maritime exchanges at New York and Philadelphia were informed of the action taken in notifying marine interests of the impending severe storm of wind and snow.

In addition to the above advices the following special warning was telegraphed to all Weather Bureau offices in New York and New England for distribution throughout their respective districts:

Heavy snow indicated for New York and New England to-night. Notify railroad and transportation interests.

At the same hour the Pennsylvania and the Baltimore and Ohio railroad companies were notified:

A cold wave with heavy snow will prevail to-night in the Allegheny Mountain districts.

During the night of the 26th the storm increased rapidly in violence and reached its height during the morning of the 27th, when the maximum wind velocities ranged from 50 to 60 miles an hour from New York to Eastport, with an ex-

treme velocity of 64 miles an hour at New York. Heavy snow Saturday night was followed during Sunday by clearing weather in the interior of New York and New England, and by the evening of the 27th the winds had begun to diminish from the northwest in the coast regions.

It will be observed from the foregoing that all action in connection with wind and snow warnings was based upon the morning reports of November 26, and that while later and special noon and 3 p. m. reports confirmed the action taken they did not call for an extension or modification of the morning advices.

The rapid advance of the western storm center to the Atlantic coast was foreseen, and the presence of an area of high barometer and low temperature over New England favored not only the south-of-east course of the storm, but also its subsequent severe development. The presence of a storm off the south Atlantic coast was indicated, rather than shown, by the morning reports, and the northward movement of this storm during the day of the 27th to a union with the western storm was an occurrence for which due allowance had been made.

The following extracts from reports made by observers of the Weather Bureau show the general character of the storm at points along the middle Atlantic and New England coasts:

Portland, Me., E. P. Jones, observer:

November 26.—Fresh to gentle westerly backing to fresh and brisk northeasterly winds.

27.—High northeast to northwest winds, with light and heavy snow. High winds and heavy snow caused great damage to shipping. From Cape Cod to Eastport reports at hand show that 56 vessels were totally wrecked, while 49 were ashore with hardly a chance of being saved. Of the 56 wrecks, barges not included, 43 craft aggregated 12,202 gross tons; of those in perilous positions, 28 aggregate 7,159 tons. The stranding of the big English liner *Ohio* and the ocean tug *Tamaqua* is not included in the estimate, nor are the big coal barges ashore in Boston Harbor. It is thought that 400 lives were lost along the New England coast during this storm. Special information to the captain of the steamer *Bay State* caused him to remain at his wharf. He was warned not to go out.

Boston, Mass., J. W. Smith, observer:

November 26.—Clear morning, but weather clouded up as the day advanced, and snow began to fall at 7:37 p. m., becoming heavy after 9:30 p. m. Light west winds until noon, then shifted to easterly, and northeast at 2:45 p. m., slowly increasing in force during the afternoon and evening. Northeast storm-signal order received at 11 a. m., with warning of heavy snowfall, the warnings of the approaching storm and heavy snow being distributed by all available means. Much inquiry for information from transportation, shipping, railroad, and other interests.

27.—The storm increased greatly in severity during the night, becoming one of the most severe for years. From 3 a. m. to 1 p. m. the hourly wind velocity ranged from 40 to 50 miles, with a maximum velocity of 60 miles at 11 a. m. and an extreme velocity at the rate of 72 miles an hour for 1 mile at 11:02 a. m. During the afternoon the wind diminished in force from the north and shifted to northwest. Snow fell heavily during the night to a depth of about 9 inches, and drifted heavily, completely stopping all railroad service, both steam and electric. The snow continued during the day and into the night, and at 8 p. m. 12 inches had fallen.

The storm caused great damage along the coast in this vicinity. Many vessels were wrecked and summer cottages blown down. In Boston harbor more than 30 vessels were reported wrecked or blown ashore, including schooners, barges, and one steamship. Six seamen were reported drowned in the outer harbor. Reports indicate that more than 50 vessels were wrecked on the Massachusetts coast, and as many more badly damaged and over 200 lives lost. The steamer *Portland* sailed Saturday evening after having been fully warned by the Weather Bureau, and was wrecked during the night or Sunday morning, and all on board, between 100 and 150 persons were lost. It is thought the steamer foundered at sea, owing to the fury of the storm, and only small portions of the boat with a number of bodies were found outside of Cape Cod.

New York, N. Y., E. H. Emery, observer:

Wind shifted to light easterly in the early morning, and gradually increased to gale velocity during the afternoon and night, and at mid-night shifted to northwest, blowing at the rate of 54 miles an hour. Southeast storm signals were hoisted 11 a. m., and warnings of heavy snow for New York and New England, received from the Chief of

Weather Bureau, were distributed to all interests in this section. Snow fell during the afternoon and night to a depth of 6 inches, and drifted badly. 27th. Snow ended in the morning, a total depth of 9.7 inches having fallen. Northwest gale all day, with velocities ranging from 40 to 65 miles. All surface cars were obliged to suspend traffic, with the exception of one cable line in New York. Of the railroad lines centering in New York only two, the New York, New Haven and Hartford Railroad, and the Long Island Railroad were blocked. These are nearly parallel lines and were directly in the path of the storm. The tracks were covered, in places, with snow to a depth of 16 feet. Other lines were delayed, but owing to the timely warnings sent out by the Weather Bureau they were enabled to take precautionary measures whereby the delay in moving trains was minimized. Twenty ocean steamers were compelled to anchor in the upper bay, where they remained during Saturday night on account of the snow and gale. The fleet of sound steamers remained at the various docks about 20 hours waiting for the storm to abate.

The following are among many editorial comments made by the daily press regarding this storm, and the action of the Weather Bureau in forecasting its destructive character.

New York Times, December 1, 1898:

In leaving Boston Saturday night the captain of the *Portland* took chances which no man in his position had a right to take. From a source that warranted implicit belief, he, like every other captain on the Atlantic coast, had received warning that a storm of exceptional severity would strike him as soon as he reached open water, and he knew that his steamer, though well built and comparatively new, was of a type much better designed for entering shallow harbors than for encountering winter gales on as dangerous a coast as there is in the world. Despite all this, and, according to his employers, in defiance of implicit orders, he steamed out into the gathering tempest. Why? * * * Perhaps he belonged to the class, once large, but now small and rapidly disappearing, the members of which sneer at the Government Weather Bureau, and prefer to rely on old "signs" instead of on new science as the basis of meteorological prophesy. Perhaps, a score of things. Only this is certain, he should not have sailed, and he should not have been allowed to sail.

The Evening Star, Washington, D. C., November 30, 1898:

The full story of Saturday night's storm may never be told. Its deadly intensity is revealed by degrees in the wreckage which floats ashore, and perhaps in a few days some approximate estimate of the havoc then wrought on the New England coast may be approachable. Meanwhile it is clear that at least one great disaster marked the gale and that many lives were sacrificed. The steamer *Portland* went to pieces some time Saturday night or Sunday morning, so far out of her course as to show that the storm was of resistless strength and that it was the most criminal folly for the captain to put out from port. * * * At half past 10 on Saturday morning the Weather Bureau in this city wired to all its observers along the New England coast the following order:

"Hoist northeast storm signals; east to northeast gales, with heavy snow to-night."

The observers were also directed to warn all railroad and transportation interests of the coming of heavy snow throughout New England. The warning about the snow was particularly important. Often a ship can go to sea with comparative safety in the face of a storm if the air is not clouded, but when the snow is flying landmarks are obscured, lighthouses are useless, and the vessel is left to fate. * * * The *Portland's* captain ignored the official warning [which had been received some eight hours before sailing time], the gale then blowing, the heavy snow then falling, and the direct orders of his superior to keep in port. He carried with him to death over 100 people, who had no knowledge, presumably, of the desperate chances which he was taking. This tragedy serves to suggest that perhaps there may be some more positive method of preventing disasters in the face of solemn warning that danger is at hand. The traveling public ought to have some safeguard against this chance of death. A foolhardy commander should not be permitted to carry out to meet the hurricane his crew and passengers who rely upon his judgment. In many States the owners of ships which are put to sea in the face of the official danger warnings can not recover their insurance money. It may perhaps be possible for the States to go farther and take steps to actually prevent the sailing of vessels under such circumstances. However impracticable such a plan may appear at first glance, the circumstances of the *Portland's* wreck warrant the consideration of any suggestion tending to prevent repetitions of the tragedy.

Mr. William U. Swan, of the New England headquarters of the Associated Press at Boston, has submitted the following report in connection with this storm:

I was on Cape Cod on Tuesday after the storm and talked with many of the life-savers and others who were out in the blow, and they all

seemed to agree that nothing so severe has ever been experienced in that part of the country.

The heft of the storm seems to have been about the time or shortly after the center passed over the Cape, which is generally agreed to have been about 9:30 on Sunday morning. The sky at that time over the stretch between Chatham and Barnstable cleared off entirely and the wind died out. Fifteen minutes after it was blowing hard from the north, and it was at this time that the gale wrought the greatest destruction among the trees from Yarmouth to Middleboro. In this respect Sandwich seems to have suffered the most, for not only did the silver oaks, as they are called, go down, but great elms in the town of Sandwich were blown across the streets, and it was a day or two before the main street was passable.

I could not find that the storm center was seen at Provincetown, or anywhere north of Eastham, but from the direction of the wind it seems probable that the storm took a diagonal course over the Cape.

THE LAKE STORM OF NOVEMBER 9-11, 1898.

The severe gale which visited the Great Lakes from the 9th to the 11th was the culmination of ten days or more of severe weather, which was very disastrous to lake marine interests. In referring to the work of the Weather Bureau during this period the Buffalo News of November 13, 1898, remarked editorially, as follows:

The Government Weather Bureau has again demonstrated in the view of all the people of the Lake region its great and growing importance as a factor in the commerce and travel of the inland seas. During the past ten days the Great Lakes have been swept by a continuation of severe storms, the fury of which but few vessels could withstand, although the majority of these vessels are as large, staunch, and seaworthy as any of the ocean liners; yet but comparatively few casualties occurred, which was due to the timely warnings of the Weather Bureau, and it is no exaggeration to say that in this instance alone millions of dollars worth of merchandise, hundreds of vessels, and probably many lives have been saved by the forecasts.

COLD WAVE WARNINGS.

The most important cold wave of the month overspread Montana during the 19th, extended over the upper Missouri Valley, with temperature below zero in Montana during the 20th, and carried the line of freezing weather, with snow and high northerly winds, as far south as Oklahoma during the 21st. By the morning of the 22d this cold wave had reached the western Lake region, the lower Ohio Valley, and the Middle and west Gulf States, with freezing weather as far south as San Antonio, Tex., and by the morning of the 23d it had reached the Allegheny Mountains, and freezing weather was noted as far south as Mobile, Ala. The morning of the 24th the minimum temperature at New Orleans and Mobile was 34° and 30°, respectively. On the latter part of the month continued cold over the eastern half of the country, and freezing temperature was reached along the south Atlantic coast on the morning of the 27th. Full and ample warning of the approach of abnormally low temperature, together with statements of the probable continuation of cold calculated to prove injurious to agricultural and commercial interests was telegraphed to all the districts visited except extreme northern Montana.

CHICAGO FORECAST DISTRICT.

The unusually stormy period in the upper Lake region continued over from October. The "northeaster" of the 9th and 10th was primarily due to the development of an area of high barometer of great magnitude over the Lake region. During the 9th a disturbance developed over the lower Mississippi Valley and moved in a northeasterly course, greatly increasing the force of the gale. Several vessels which had not heeded the warnings of the Weather Bureau were wrecked.

A severe "norther" and cold wave reached the eastern limits of the Chicago forecast district the evening of the 22d. Timely notice of its approach was given in the warnings issued

by the Chicago office and the Central Office at Washington to all States, except a portion of Montana, where its appearance could not be foreseen. Additional warnings were sent to all districts threatened with the advice that the storm and cold wave would be unusually severe. Press reports indicate that large numbers of cattle were saved in the Western States by the warnings, and that other interests were greatly benefited. The gale which attended the severe storm which preceded the advance of the cold wave was very high on the Lakes, and all vessels remained in port, except when it was possible for staunch craft to move along the lee shores.—*H. J. Cox, Forecast Official.*

SAN FRANCISCO FORECAST DISTRICT.

No marked or destructive weather changes or conditions were reported in the Pacific coast forecasting districts.

GALVESTON FORECAST DISTRICT.

Mr. I. M. Cline, local forecast official and section director, Galveston, Tex., has submitted the following report in connection with special temperature warnings issued November 21, 1898:

The following warning was issued at 4 p. m.: "Temperature will probably fall to 30° within 100 miles of Galveston and to 42° at Galveston Tuesday."

All sugar planters and truck growers to the coast line were advised over the telegraph and long-distance telephone to protect their crops and they acted without delay. The minimum temperature on Tuesday, the 22d, fell to and below freezing throughout the interior of the State and reached 34.5° at Galveston. Many acknowledgments of the value of the warnings were received, and cane and vegetables to the value of many thousands of dollars were reported saved.

AREAS OF HIGH AND LOW PRESSURE.

During November the paths of nine highs and of fourteen lows were sufficiently well defined to be traced on Charts I and II. On these charts a circle is placed at the position of each center of high or low pressure at 8 a. m. and 8 p. m., eastern time, with the date on the outside of the circle, and the reading of the barometer on the inside. The accompanying table exhibits the principal facts regarding the first and last appearance of the highs and lows, their duration, and apparent velocity.

Highs.—There seemed to be a rather permanent high pressure area on the middle Pacific coast, and some of the highs appeared to originate or separate from this permanent condition. Nos. VII and VIII were first noted to the north of Montana. The general tendency of the highs was along a lower parallel than in October. No. I disappeared in the middle Rocky Mountain region. Nos. III, V, and VII were last seen over Newfoundland, and the rest disappeared off the middle Atlantic coast. The temperature conditions accompanying these highs were quite moderate. On the 8th, as No. IV passed across the middle Rocky Mountain region, there was a fall of 30° in twenty-four hours at Denver in the morning, and of 34° in the evening at Pueblo. The severest cold wave of the month accompanied high area No. VII, and in this area the highest absolute barometer readings of the month were noted. On the evening of the 20th Denver experienced a fall in temperature of 50° in twenty-four hours, and to 12°. On the morning of 21st Denver reported a fall of 54°, and to 4°. On evening of 21st the cold wave had moved rapidly eastward, Springfield, Mo., experiencing a fall of 52°, and to 12°. The next morning the same station reported a fall of 44°, and to 12°. On evening of 22d Chicago reported a fall of 42°, and to 14°, and Cincinnati had a fall of 42°, and to 22°. On morning of 23d Columbus and Cleve-

land reported a fall of 36°, and to 20° and 18° respectively.

Lows.—The month was very prolific in low areas, no less than fourteen having been charted. Nine of these began to the north of Montana; one, No. XI, in the Red River Valley; Nos. IV and VI in Arizona; and X and XIV on the south Atlantic coast. The general track of these lows was along the north border of the United States, and ten of them were last noted off Nova Scotia or over Newfoundland. No. XIII was last seen in Ontario. Nos. V, XI, and XII in the Red River Valley, and VI in the central Gulf.

The highest winds of the month were reported as follows: As storm No. II approached Lake Superior, afternoon of 4th, a south wind of 60 miles an hour occurred at Chicago. As the same storm passed the lower Lake region it caused a west wind of 68 miles at Buffalo. On the afternoon of 11th, as IV passed to the north Atlantic coast, it caused a northwest gale of 56 miles at New York City. On the afternoon of 21st, as No. IX approached Lake Michigan, Duluth experienced a northwest wind of 52 miles, and Grand Haven the same velocity from the southeast. On the evening of 26th, as storm No. XI passed up the middle Atlantic coast, Block Island reported a northeast wind of 60 miles and accompanying the same storm the next morning Hatteras and New York City reported a northwest wind of 56 miles, Sandy Hook a northeast wind of 60 miles, Boston a north wind of 56 miles, and Eastport a northeast wind of 56 miles.—*H. A. Hazen, Professor.*

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.										
I.....	*31, p. m.	43	127	2, p. m.	39	106	Miles. 1,210	Days. 2.0	Miles. 605	Miles. 25.2
II.....	3, p. m.	37	124	8, p. m.	37	75	3,540	5.0	708	29.5
III.....	6, p. m.	41	126	10, p. m.	48	55	3,720	4.0	930	38.7
IV.....	7, p. m.	43	123	14, a. m.	41	69	3,060	6.5	471	19.6
V.....	11, p. m.	43	120	18, a. m.	47	56	4,290	6.5	655	27.3
VI.....	15, p. m.	42	121	21, p. m.	36	73	3,070	6.0	512	21.3
VII.....	18, p. m.	54	117	26, p. m.	47	61	3,480	8.0	435	18.1
VIII.....	23, p. m.	52	108	29, a. m.	38	73	2,430	5.5	442	18.3
IX.....	26, p. m.	42	116	30, p. m.	31	78	3,030	4.0	757	31.6
Total.....							27,800	47.7	5,515	229.6
Mean of 9 paths.....							3,089		613	25.5
Mean of 47.5 days.....									585	24.4
Low areas.										
I.....	*29, p. m.	47	125	2, p. m.	48	66	3,030	4.0	757	31.6
II.....	1, p. m.	55	118	7, p. m.	47	54	3,480	6.0	580	24.2
III.....	6, a. m.	52	120	8, p. m.	49	69	2,580	2.5	1,032	43.0
IV.....	7, a. m.	32	114	11, p. m.	48	59	3,480	4.5	580	24.2
V.....	9, p. m.	55	114	11, a. m.	52	96	780	1.5	520	21.7
VI.....	10, p. m.	34	114	13, a. m.	29	93	1,290	2.5	516	21.5
VII.....	11, p. m.	53	113	14, p. m.	49	55	2,670	3.0	890	37.1
VIII.....	16, p. m.	53	118	20, p. m.	47	56	3,270	4.0	817	34.1
IX.....	18, a. m.	51	123	23, p. m.	42	67	3,050	5.5	555	23.1
X.....	23, a. m.	34	76	25, p. m.	46	58	1,350	2.5	540	22.5
XI.....	24, p. m.	49	99	29, a. m.	44	58	2,880	4.5	640	26.7
XII.....	25, p. m.	52	116	27, a. m.	52	97	810	1.5	540	22.5
XIII.....	27, a. m.	52	122	30, a. m.	47	81	1,830	3.0	610	25.4
XIV.....	29, a. m.	31	80	†1, p. m.	44	60	1,890	2.5	756	31.5
Total.....							32,390	47.5	9,333	389.1
Mean of 14 paths.....							2,314		667	27.8
Mean of 47.5 days.....									682	28.4

* October.

† December.

RIVERS AND FLOODS.

The annual rise appears to have set in during the latter half of the month, except in the Missouri and upper Mississippi rivers, where steady rises are not the rule during the winter season. The Ohio and its tributaries were the first to rise, the crest of the highest water reaching Parkersburg on the 14th, Cincinnati on the 17th, and Cairo on the 20th, and thence extending down the Mississippi. The highest waters

in the Arkansas and Red rivers occurred near the close of the month. The general conditions are graphically shown on the hydrograph for the month. (See Chart V.) The stage of water continued satisfactory on all the navigable rivers, and navigation was continued in the upper rivers until the channels became frozen over. The upper Missouri was the first to freeze, and next the Des Moines River. On the 22d ice formed along the banks of the Des Moines, and on the 23d the river was frozen over with ice 2 inches thick. It again opened, however, on the last day of the month.

In the Mississippi there was running ice as far south as Grafton. Light ice commenced running on the 22d at Reads Landing, and on the 23d was also running as far south as Keokuk, reaching Grafton on the 27th. On the 24th ice was forming in the Des Moines rapids, and on the 26th navigation was entirely closed along the river, above the mouth of the Des Moines. The earliest dates of complete freezing over were as follows: Red Wing, 22d; North McGregor, 24th; La Crosse, 26th; and Leclaire, 26th. On this latter date there was also an ice gorge at Burlington. The upper Missouri was frozen over at Pierre on the 22d, after ice had been running for a dozen days. In the lower Missouri there was floating ice from the 22d until the end of the month, and there were temporary blockades at Kansas City on the 24th, 29th, and 30th.

The highest and lowest water, mean stage, and monthly range at 117 river stations are given in the accompanying table. Hydrographs for typical points on seven principal rivers are shown on the Chart. The stations selected for charting are: Keokuk, St. Louis, Cairo, Memphis, and Vicksburg, on the Mississippi; Cincinnati, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—H. C. Frankenfield, *Forecast Official*.

Heights of rivers referred to zeros of gauges, November, 1898.

Stations.	Distance to mouth of river.	Danger line on gauge.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Mississippi River.	<i>Miles.</i>	<i>Feet.</i>	<i>Feet.</i>		<i>Feet.</i>		<i>Feet.</i>	<i>Feet.</i>
St. Paul, Minn.....	1,937	14	3.9	1-2	3.1	14-22	3.4	0.8
Reads Landing, Minn....	1,887	12	2.1	1-2	-0.9	29-30	1.2	3.0
La Crosse, Wis.....	1,822	12	3.7	1	2.4	20-23	2.9	1.3
North McGregor, Iowa..	1,762	18	3.1	1	0.1	26	2.2	3.0
Dubuque, Iowa.....	1,702	15	3.2	2	0.1	27	2.4	3.1
Leclaire, Iowa.....	1,612	10	1.8	2-3	0.5	26	1.4	1.3
Davenport, Iowa.....	1,596	15	2.8	1-7, 10, 11	-0.4	30	2.3	3.2
Galland, Iowa.....	1,475	8	1.5	6	0.5	29-30	1.3	1.0
Keokuk, Iowa.....	1,466	14	2.2	6	0.4	28-30	1.5	1.8
Hannibal, Mo.....	1,405	17	3.4	6	1.2	30	2.7	2.2
Grafton, Ill.....	1,307	35	6.1	12	4.4	30	5.2	1.7
St. Louis, Mo.....	1,264	30	9.0	1	5.5	20-21	6.8	3.5
Chester, Ill.....	1,189	30	6.3	1	3.0	22-23	4.2	3.3
Cairo, Ill.....	1,073	45	19.9	20, 21	12.2	10	16.7	7.7
Memphis, Tenn.....	843	33	12.5	23	7.2	13	10.2	5.3
Helena, Ark.....	797	42	15.8	24	11.7	14	15.5	7.1
Arkansas City, Ark.....	635	42	19.2	25	13.2	16	16.8	6.0
Greenville, Miss.....	595	42	15.7	26	10.8	6, 7	13.5	4.9
Vicksburg, Miss.....	474	45	17.0	29	11.6	18	14.3	5.4
New Orleans, La.....	108	16	6.0	30	3.8	1	5.2	2.2
Arkansas River.								
Wichita, Kans.....	730	10	1.5	25-28	1.0	6	1.2	0.5
Fort Smith, Ark.....	345	22	7.4	24, 26	2.8	13, 14, 18, 19	4.1	4.6
Dardanelle, Ark.....	250	21	7.2	27	1.9	30, 31	3.5	5.3
Little Rock, Ark.....	170	33	8.7	27	3.5	19-21	5.0	5.2
White River.								
Newport, Ark.....	150	26	10.5	28	3.6	21	5.7	6.9
Des Moines River.								
Des Moines, Iowa.....	150	19	3.3	21, 22	2.8	8-13	3.0	0.5
Illinois River.								
Peoria, Ill.....	135	14	10.0	23	7.1	8, 9	8.4	2.9
Missouri River.								
Bismarck, N. Dak.....	1,301	14	2.7	21, 26	2.3	9, 10	2.5	0.4
Pierre, S. Dak.....	1,006	14	2.4	1-13	1.7	21	2.3	0.7
Sioux City, Iowa.....	676	19	5.8	1	5.6	10, 16-21	5.7	0.2
Omaha, Nebr.....	561	18	6.5	1-5	5.0	22	6.3	1.5
St. Joseph, Mo.....	373	10	3.4	28, 29	0.8	16, 17	1.4	2.6
Kansas City, Mo.....	280	21	6.5	22, 23	5.4	29	6.0	1.1
Boonville, Mo.....	191	20	7.1	24	3.2	30	5.3	3.9
Boonville, Mo.....	95	24	8.1	25	4.1	21	5.5	4.7
Ohio River.								
Pittsburg, Pa.....	966	22	15.6	12	3.2	29, 30	6.5	12.4
Davis Island Dam, Pa....	960	25	15.0	12	4.9	6	7.7	10.1
Wheeling, W. Va.....	875	36	21.1	13	5.6	6	9.5	15.5
Parkersburg, W. Va.....	785	36	20.8	14	7.0	6	10.7	13.8
Point Pleasant, W. Va....	708	39	22.0	14	5.6	6	11.7	16.4
Catlettsburg, Ky.....	651	50	25.7	15	7.5	6	14.7	18.2

Heights of rivers above zeros of gauges—Continued.

Stations.	Distance to mouth of river.	Danger line on gauge.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Ohio River—Cont'd.	<i>Miles.</i>	<i>Feet.</i>	<i>Feet.</i>		<i>Feet.</i>		<i>Feet.</i>	<i>Feet.</i>
Portsmouth, Ohio.....	612	50	25.8	15	8.5	7, 8	15.4	17.3
Cincinnati, Ohio.....	490	50	26.8	17	10.3	9	17.6	16.5
Louisville, Ky.....	367	28	10.5	17, 18	6.4	9	8.3	4.1
Evansville, Ind.....	184	35	19.9	19	9.0	9	14.2	10.9
Paducah, Ky.....	47	40	16.0	19, 20	7.5	9, 10	11.9	8.5
Allegheny River.								
Warren, Pa.....	177	7	8.0	11	1.1	6	3.2	6.9
Oil City, Pa.....	123	13	8.5	12	2.0	30	3.7	6.5
Parkers Landing, Pa.....	73	20	10.0	12	1.7	5	4.0	8.3
Freeport, Pa.....	26	20	15.4	12	3.3	6	6.5	12.1
Conemaugh River.								
Johnstown, Pa.....	64	7	3.8	11	1.4	30	2.1	2.4
Red Bank Creek.								
Brookville, Pa.....	35	8	3.2	11	1.0	1-6, 9	1.4	2.2
Beaver River.								
Ellwood Junction, Pa....	10	14	5.2	11	0.7	5	1.6	4.5
Cumberland River.								
Burnside, Ky.....	434	50	14.3	12	2.3	5	5.2	12.0
Carthage, Tenn.....	257	30	12.2	14	2.5	5	3.3	9.7
Nashville, Tenn.....	175	40	15.3	15	3.9	5	8.0	11.4
Great Kanawha River.								
Charleston, W. Va.....	61	30	11.3	21	4.8	1, 4, 29, 30	6.8	6.5
New River.								
Hinton, W. Va.....	95	14	4.6	21	2.2	6-11	2.7	2.4
Licking River.								
Falmouth, Ky.....	30	25	7.0	12	1.2	30	2.7	5.8
Miami River.								
Dayton, Ohio.....	69	18	4.5	11	1.3	4, 5, 27, 28	2.2	3.2
Monongahela River.								
Weston, W. Va.....	161	18	3.1	11	-0.2	5, 28	0.4	3.3
Fairmont, W. Va.....	119	25	6.8	21	1.1	5	2.7	5.7
Greensboro, Pa.....	81	18	12.0	11, 12	7.0	28, 30	8.6	5.0
Lock No. 4, Pa.....	40	28	14.7	12	7.1	6	9.1	7.6
Cheat River.								
Rowlesburg, W. Va.....	36	14	5.6	12	2.2	5, 9	3.6	3.4
Youghiogheny River.								
Confluence, Pa.....	59	10	5.0	11	1.9	5	3.0	3.1
West Newton, Pa.....	15	23	4.6	11	0.9	29	1.8	3.7
Muskingum River.								
Zanesville, Ohio.....	70	20	15.1	12	7.3	4, 5	9.6	7.8
Tennessee River.								
Kingston, Tenn.....	534	25	3.6	23-26	1.6	5	2.5	2.0
Chattanooga, Tenn.....	430	33	6.9	24	3.9	5, 6	5.0	3.0
Bridgeport, Ala.....	390	24	5.1	24	2.2	5, 6	3.2	2.9
Florence, Ala.....	220	16	4.9	25	1.9	8, 9	2.9	3.0
Johnsonville, Tenn.....	94	21	6.9	27	3.2	9	4.5	3.7
Clinch River.								
Speers Ferry, Va.....	156	20	2.2	30	-0.4	5	0.4	2.6
Clinton, Tenn.....	46	25	8.7	22	3.5	3, 4	5.4	5.2
Wabash River.								
Mount Carmel, Ill.....	50	15	11.5	15	3.1	5	6.0	8.4
Red River.								
Arthur City, Tex.....	688	27	6.6	23	4.3	19-22	4.7	2.3
Fulton, Ark.....	565	28	8.4	26	2.8	7, 8	4.0	6.1
Shreveport, La.....	449	29	5.1	30	-0.1	9	1.9	5.2
Alexandria, La.....	139	33	4.1	23	-0.9	8	1.7	5.0
Atchafalaya Bayou.								
Melville, La.....	100*	31	19.8	30	13.8	1, 2	16.7	6.0
Ouachita River.								
Camden, Ark.....	340	39	13.2	13	4.0	8	7.5	9.2
Monroe, La.....	100	40	19.4	18, 19	4.2	8	13.5	15.2
Yazoo River.								
Yazoo City, Miss.....	80	25	0.7	1, 23	-1.0	9, 10	-0.1	0.8
Flint River.								
Albany, Ga.....	80	20	16.1	23	1.2	8	6.5	14.9
Cape Fear River.								
Fayetteville, N. C.....	100	38	12.2	21	3.5	13	6.4	8.7
Columbia River.								
Umatilla, Ore.....	270	25	2.6	23	1.9	16	2.3	0.7
The Dalles, Ore.....	166	40	3.0	23	2.0	14, 15	2.6	1.0
Willamette River.								
Albany, Ore.....	99	20	16.4	20	1.0	15	5.2	15.4
Portland, Ore.....	10	15	7.0	20	1.2	8-10	3.7	5.8
Edisto River.								
Edisto, S. C.....	75	6	5.5	22	2.2	14	4.0	3.3
James River.								
Lynchburg, Va.....	257	18	4.0	20	1.3	10-12	2.0	2.7
Richmond, Va.....	110	12	2.0	22	0.5	11-16	1.0	1.5
Alabama River.								
Montgomery, Ala.....	265	35	14.2	20	2.7	5, 6	7.0	11.5
Selma, Ala.....	212	35	16.9	21	2.9	7	9.0	14.0
Coosa River.								
Rome, Ga.....	225	30	7.0	24	2.0	5	3.3	5.0
Gadsden, Ala.....	144	18	7.0	23, 24	1.8	5-8, 12	3.4	5.2
Tombigbee River.								
Columbus, Miss.....	285	33	2.1	23	-3.2	9	-1.4	5.3
Demopolis, Ala.....	155	35	12.0	26	-2.0	9	3.2	14.0
Black Warrior River.								
Tuscaloosa, Ala.....	90	38	11.7	24	0.0	5	3.0	11.7
Pedee River.								
Cheraw, S. C.....	145	27	10.5	20	1.5	6	3.8	9.0
Black River.								
Kingstree, S. C.....	60	12	10.7	30	1.9	12-16	4.2	8.8
Lumber River.								
Fairbluff, N. C.....	10	6	5.1	27	0.8	9	2.6	4.3
Lynch Creek.								
Effingham, S. C.....	35	12	13.8	26	3.7	7, 8	7.4	10.1
Potomac River.								
Harpers Ferry, W. Va....	170	16	3.7	1	2.4	26, 27	2.7	1.3
Roanoke River.								
Clarksburg, Va.....	155	12	3.8	1	1.0	11	1.6	2.8
Sacramento River.								
Red Bluff, Cal.....	241	23	1.2	30	-0.7	6	-0.2	1.9
Sacramento, Cal.....	70	25	8.2	22	7.5	11-19	7.7	0.7

Heights of rivers above zeros of gauges—Continued.

Stations.	Distance to mouth of river.	Danger line on gauge.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
<i>Santee River.</i>	<i>Miles.</i>	<i>Feet.</i>	<i>Feet.</i>		<i>Feet.</i>		<i>Feet.</i>	<i>Feet.</i>
St. Stephens, S. C.	50	12	8.1	27, 28	4.5	13, 14	7.0	3.6
<i>Congaree River.</i>								
Columbia, S. C.	37	15	2.8	18	0.4	4, 5	1.0	2.4
<i>Wateries River.</i>								
Camden, S. C.	45	24	13.0	17	4.3	13	6.9	8.7
<i>Savannah River.</i>								
Augusta, Ga.	130	32	17.4	17	7.4	11	9.8	10.0

* Distance to Gulf of Mexico.

† Record for 30 days.

Heights of rivers above zeros of gauges—Continued.

Stations.	Distance to mouth of river.	Danger line on gauge.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
<i>Susquehanna River.</i>	<i>Miles.</i>	<i>Feet.</i>	<i>Feet.</i>		<i>Feet.</i>		<i>Feet.</i>	<i>Feet.</i>
Wilkesbarre, Pa.	178	14	12.0	12	3.0	5-10, 29, 30	5.2	9.0
Harrisburg, Pa.	70	17	8.8	13	2.5	8-10	4.2	6.3
<i>Juniata River.</i>								
Huntingdon, Pa.	80	24	5.5	11	3.5	7-10	3.9	2.0
<i>W. Br. of Susquehanna.</i>								
Williamsport, Pa.	35	20	9.4	12	1.8	8-10, 29, 30	3.3	7.6
<i>Waccamaw River.</i>								
Conway, S. C.	40	7	4.1	26, 27, 30	1.4	12	2.7	2.7

THE WEATHER OF THE MONTH.

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

The statistical aspects of the weather of the month are presented in the tables which form the closing part of this REVIEW. Table I, in particular, contains numerous details that are important in the study of climatology. The numerical values in the tables have been generalized in a number of cases, the results appearing on Charts Nos. III to IX, inclusive.

PRESSURE AND WIND.

Normal conditions.—The geographic distribution of normal barometric readings at sea level and under local gravity for November is shown by Chart V of the MONTHLY WEATHER REVIEW for November, 1893.

Normal pressure in November is highest over the middle Plateau region, where it is above 30.20 inches; it is above 30.15 over the interior of the middle and east Gulf and south Atlantic States. Normal pressure is lowest in November over the lower Colorado Valley and over the Gulf of Saint Lawrence, where it is below 30.00 inches.

As compared with October there is generally an increase of normal pressure, the increase being greatest over the middle Plateau region, where it exceeds .10 inch. The winter highs of the middle Plateau region and the south Atlantic States are now firmly established.

In November the prevailing winds of the south Atlantic States blow from the north, inclining slightly to the northeast on the Florida peninsula. Passing westward through the Gulf coast States, easterly or northeasterly winds prevail until central Texas is reached. Here the prevailing direction becomes southwesterly, which direction is preserved over a considerable area extending northeasterly to Arkansas and again from the middle Mississippi Valley to the Lake region. The prevailing winds of the upper Lakes, the Northwest, and the eastern slope of the Rocky Mountains blow from the northwest. On the Pacific coast the prevailing winds blow from the south from Oregon northward and from the north over California and portions of Arizona.

The current month.—The distribution of monthly mean pressure and the resultant winds are shown on Chart IV. The configuration of the isobars is in close accord with normal conditions, although both western and eastern highs are restricted somewhat in area. Pressure was below normal on the northeastern Rocky Mountain slope, the Lake region, New England, and the Canadian Maritime Provinces, although it is to be noted that pressure was reported .07 inch in excess at St. Johns, Newfoundland. As compared with the preceding month there was a rise in pressure over the southern three-fifths of the country and a fall over the remaining portion, the greatest decrease, .18 inch, occurring in Nova Scotia.

TEMPERATURE OF THE AIR.

Normal conditions.—The normal temperature of the air in the United States in November varies from about 74° at Key West, 61° at Jacksonville, 61° at New Orleans, 62° at Galveston, 59° at San Diego, to 37° at Eastport, 36° at Burlington, 38° at Buffalo, 38° at Detroit, 29° at Duluth, 21° at St. Vincent, 30° at Havre, 38° at Spokane, and 45° at Seattle, on Puget Sound. The warmest regions are the lower Rio Grande Valley and Florida; the coolest, Minnesota and North Dakota.

In studying the distribution of monthly mean temperatures it will be found very helpful to consult the charts at the end of this REVIEW, especially No. VI, Surface Temperatures, Maximum, Minimum, and Mean. This chart gives a very good idea of the variations of temperature with latitude and longitude, and also of the distribution of normal surface temperatures. Chart VI for any month will differ from a normal chart merely in the displacement or bending of the isotherms northward or southward according as the temperature of the particular locality is above or below the normal for the place and season.

The current month.—The month was devoid of abnormal conditions. Temperature continued low for the season over the Plateau region, Wyoming, parts of Montana, the Dakotas, and Kansas. Temperature was also below average in eastern Texas, the lower Mississippi Valley and Tennessee. Temperature was above average in Florida and the Lake region and also over small areas in Oregon and California.

Generally low temperatures prevailed, but the departures from the normal were not large, the greatest not exceeding 5° per day.

Two cold waves occurred during the month. The first one was widespread and rather severe for the season. On the morning of the 21st it had overspread the middle Missouri Valley, Kansas, northwestern Oklahoma and Indian Territory, and extreme northern Texas, causing a fall in temperature of from 30° to 50° from the middle Missouri Valley over the central Rocky Mountain districts and snow as far south as the panhandle of Texas. By the morning of the 22d the cold had reached the Gulf coast, extending thence in a northerly direction to the British Possessions. Minimum temperatures in the Gulf coast States were as follows: Texas, 23° at Fort Worth and 34° at Galveston; Louisiana, 25° at Shreveport and 34° at New Orleans; Mississippi, 26° at Vicksburg; Alabama, 26° at Montgomery and 31° at Mobile. The cold wave moved eastward during the succeeding twenty-four hours but the temperature fall was not so great in the lower Lake region and east of the Appalachians as it had been in the region to the westward. The second cold wave of the month moved

rapidly southeastward from the Lake Superior region during the night of the 26th. It was not so widespread as the one first described, but the temperatures registered in New England, the Middle and south Atlantic States, and the Ohio Valley and Tennessee were the lowest of the month.

Maximum temperatures of 90° and over were recorded in the lower Rio Grande Valley and portions of Arizona and southern California. The maximum temperature of the month was not above 60° in portions of Maine and from the western end of Lake Superior westward to the Pacific coast.

The lowest minimum temperatures of the month were recorded in North Dakota, the highest in Florida.

The distribution of the observed monthly mean temperature of the air is shown by red lines (isotherms) on Chart VI. This chart also shows the maximum and the minimum temperatures, the former by black and the latter by dotted lines. As will be noticed, these lines have been drawn over the Rocky Mountain Plateau region, although the temperatures have not been reduced to sea level; the isotherms relate, therefore, to the average surface of the country in the neighborhood of the various observers, and as such must differ greatly from the sea-level isotherms of Chart IV.

The average temperatures of the respective geographic districts, the departures from the normal of the current month and from the general mean since the first of the year, are presented in the table below for convenience of reference:

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
New England	10	41.1	0.0	+ 14.1	+ 1.3
Middle Atlantic	12	44.4	- 0.3	+ 17.2	+ 1.6
South Atlantic	10	53.8	- 1.1	+ 9.6	+ 0.9
Florida Peninsula	7	67.4	+ 1.0	+ 5.3	+ 0.5
East Gulf	7	55.4	- 2.4	+ 0.9	+ 0.1
West Gulf	7	53.8	- 2.7	+ 10.5	+ 1.0
Ohio Valley and Tennessee	12	43.6	- 1.4	+ 17.6	+ 1.6
Lower Lake	8	39.0	- 0.1	+ 27.5	+ 2.5
Upper Lake	9	35.2	+ 1.8	+ 27.8	+ 2.5
North Dakota	7	22.3	- 1.0	+ 19.2	+ 1.7
Upper Mississippi	11	36.2	- 1.1	+ 18.5	+ 1.6
Missouri Valley	10	35.1	- 2.0	+ 18.3	+ 1.6
Northern Slope	7	29.6	- 2.8	+ 3.2	+ 0.3
Middle Slope	6	39.1	- 2.4	+ 7.2	+ 0.7
Southern Slope	6	46.2	- 2.4	+ 2.8	+ 0.3
Southern Plateau	13	47.4	- 0.6	+ 0.2	0.0
Middle Plateau	9	34.8	- 2.8	+ 9.3	+ 0.8
Northern Plateau	10	34.6	- 3.1	+ 2.8	+ 0.3
North Pacific	9	44.3	- 0.8	+ 8.3	+ 0.8
Middle Pacific	5	52.4	- 1.2	+ 5.6	+ 0.5
South Pacific	4	57.5	0.0	+ 3.9	+ 0.4

In Canada.—Prof. R. F. Stupart says:

Temperature was from average to 2° below in that portion of Ontario contained in the country from the St. Clair River northeast and east, respectively, to the southern shores of the Georgian Bay and the western portion of Lake Ontario, and above elsewhere to the eastward in all localities as far as our extreme eastern Atlantic and Gulf of St. Lawrence shores, the excess being as great as 6° at Halifax, 5° at Charlottetown, and 4° at Sydney. In northern Ontario it was as much as 3° above average. In Manitoba it was generally a little above average, so also in Vancouver Island. In the northern portion of Saskatchewan it was likewise above, generally, but elsewhere the temperature in the Territories was not up to average, the deficiency amounting to from 2° to 3° in southern Alberta.

FROST.

Alabama.—Mobile, first killing frost, or freezing temperature, 23d.

Florida.—Heavy frost at Crawfordville, 23d; De Funiak Springs, 20th, 23d, 24th, 27th, 30th; Haywood, 1st, 22d, 23d, 24th, 25th, 26th, 27th.

Georgia.—First killing frost at Jesup, Pisco, Crescent, and Savannah, 27th.

South Carolina.—First killing frost at Charleston, Edisto, Georgetown, Port Royal, St. Georges, Smiths Mills, and Ye-

massee, 27th; Cheraw, Holland, and Marion, 1st; Columbia, Gillisonville, Greenville, Pinopolis, St. Matthews, Statesburg, Summersville, Winnsboro, and Wolling, 25th; Society Hill, 24th.

Texas.—Killing frost at Boerne, 22d, 23d; Brenham, 23d; Corsicana, 10th, 22d, 23d, 24th; Dallas, 22d, 23d, 24th, 25th; Duval, 22d, 23d, 24th; El Paso, 10th; Fort Stockton, 27th; Golindo, 22d, 23d, 24th; Hallettsville, 22d; Houston, 22d, 23d; Llano, 22d, 23d, 24th; San Antonio, 22d; Waco, 23d, 24th.

PRECIPITATION.

Normal conditions.—Heavy rains in November (4 to 6 inches and over) occur in the Gulf States, lower Mississippi and Ohio valleys, Tennessee, over limited areas in New England, and on the coasts of Washington and Oregon. The normal rainfall east of the one hundredth meridian, excluding the territory above described, is from 1 to 3 inches. On the Pacific coast the area of 2-inch rains extends southward to the thirty-fifth parallel. South of the Tehachapi range in California the rainfall is less than an inch, except on the coast. Between the one hundredth and one hundred and twenty-second meridians the precipitation of November is light in quantity and variable in distribution.

The current month.—On the whole the month was one of rather more than the usual amount of precipitation. The whole of New England, the south Atlantic, and Gulf States (except small areas in Florida and western Texas), the north Pacific coast, the northern slope, the northern Plateau, the middle Plateau, southern Minnesota, Iowa, Kansas, and Nebraska received more than the average amount of precipitation.

The regions of deficient rainfall were California, the middle Mississippi and Ohio valleys, western Texas and New Mexico, and parts of the Lake region, the Dakotas, and Montana.

The greatest monthly falls occurred in southern Louisiana, southern Alabama, and on the north Pacific coast. The fall in California was considerably below the average, notwithstanding the fact that there was an abundance of rain on the coasts of Washington and Oregon.

Average precipitation and departures from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
New England	10	6.21	155	+2.30	+ 6.80
Middle Atlantic	12	4.16	124	+0.80	0.00
South Atlantic	10	4.07	133	+1.00	- 5.80
Florida Peninsula	7	2.03	84	-0.40	- 6.90
East Gulf	7	5.70	150	+1.90	+ 2.70
West Gulf	7	3.36	85	-0.60	- 4.00
Ohio Valley and Tennessee	12	2.58	70	-1.10	+ 1.10
Lower Lake	8	3.08	97	-0.10	+ 0.20
Upper Lake	9	1.75	71	-0.70	- 1.20
North Dakota	7	0.50	86	-0.10	- 0.40
Upper Mississippi	11	1.82	86	-0.30	+ 6.20
Missouri Valley	10	1.18	80	-0.30	+ 3.20
Northern Slope	7	0.60	120	+0.10	- 0.10
Middle Slope	6	0.90	100	0.00	+ 2.30
Southern Slope	6	0.58	49	-0.60	- 3.50
Southern Plateau	9	0.55	85	-0.10	- 2.50
Middle Plateau	13	1.33	160	+0.50	- 1.40
Northern Plateau	10	2.10	130	+0.50	- 2.80
North Pacific	9	7.97	107	+0.50	- 6.10
Middle Pacific	5	1.54	51	-1.50	-10.30
South Pacific	4	0.14	10	-1.20	- 6.60

The geographic distribution of precipitation is shown on Chart III, and the numerical values for about 3,000 stations appear in Tables II and III, while the details as to excessive rains will be found in Table XI.

In Canada.—Professor Stupart says:

Precipitation was abnormally heavy throughout the Maritime Provinces, the average being exceeded by nearly 5.0 inches at Halifax and Grand Manan; by 4.2 inches at Sydney, 4.0 inches at Yarmouth, and

2.0 inches at Charlottetown. In Manitoba and also over the greater portion of the Northwest Territories precipitation was a little in excess of average, but in all the remaining portion of the Dominion it was below the usual amount, except locally in the lower Lake region, where the average was just maintained. The deficiency was very marked in Ottawa and St. Lawrence valley as well as over Vancouver Island. In the Northwest Territories and Manitoba precipitation was chiefly in the form of snow, and at the end of the month the ground was covered to a depth of 8 inches at Winnipeg to 6 inches at Battleford and 5 inches at Qu'Appelle. Several pronounced snowfalls occurred in many portions of Ontario and more locally in Quebec and the Maritime Provinces, but at the close of the month there was little snow on the ground over any portion of these Provinces except very locally. Along the north shore of Lake Superior the greatest amount on the ground reported from any station was only 3 inches.

HAIL.

The following are the dates on which hail fell in the respective States:

Arizona, 20, 25. Idaho, 3, 5, 6. Illinois, 5, 17, 21. Indiana, 5. Kentucky, 5. Missouri, 5. New Mexico, 12. North Carolina, 12, 15, 19. Ohio, 5, 14. Tennessee, 5. Wisconsin, 5.

SLEET.

The following are the dates on which sleet fell in the respective States:

Alabama, 28. Arkansas, 12, 21, 25, 26, 27, 30. Colorado, 17, 27, 30. Connecticut, 24, 30. Delaware, 6, 25. Georgia, 28. Idaho, 16, 23, 27. Illinois, 12, 22, 28, 29. Indiana, 10, 14, 22, 28. Iowa, 13, 20, 21, 22. Kansas, 12, 20, 21, 22, 27, 30. Kentucky, 11, 14, 22, 23, 25, 28, 29. Louisiana, 11, 25, 27. Maine, 24, 25. Maryland, 14, 19, 24, 26, 29. Massachusetts, 6, 17, 24, 25, 26, 27. Michigan, 5, 7, 9, 10, 13, 14, 22. Minnesota, 4, 21, 22. Mississippi, 11, 25, 26, 27. Missouri, 8, 9, 10, 20, 21, 22, 25, 26, 27, 28, 30. Montana, 3, 9, 10. Nebraska, 17, 21, 27. Nevada, 22, 27, 28, 29. New Hampshire, 10, 24, 30. New Jersey, 24, 29, 30. New Mexico, 26. New York, 6, 7, 10, 11, 13, 14, 15, 20, 23, 24, 26. North Carolina, 24, 26, 28, 29. North Dakota, 8, 16, 18, 20. Ohio, 5, 6, 10, 14, 19, 21, 22, 26, 28, 29. Oklahoma, 21, 27. Pennsylvania, 11, 24, 29, 30. Rhode Island, 24, 26, 27. South Carolina, 25, 26, 28. South Dakota, 12, 13, 21, 24, 27, 28, 29. Tennessee, 26, 27, 28, 29. Utah, 22, 29. Vermont, 10, 11, 23, 25. Virginia, 13, 16, 26, 27, 28, 29. Washington, 6, 7, 18, 19, 20, 21, 24, 26, 28. West Virginia, 14, 19, 23, 29. Wisconsin, 21, 22. Wyoming, 1.

SNOWFALL.

The total snowfall for the current month is given in Tables I and II, and its geographic distribution is shown on Chart VIII. An examination of this chart shows that, aside from isolated mountain stations in Colorado and Wyoming, the snowfall of New England was greater than for any other region. The region about the southern end of Lake Michigan received a rather generous snowfall, two stations in Michigan reporting 24 and 33 inches, respectively. There was another but smaller region of heavy snow in central and western Iowa. Heavy snow, 10 inches and over, also fell in northern Wisconsin and eastern Minnesota. The snowfall of the middle and northern mountain regions of the West appears to have been fairly generous. The fall in the southern part of the mountain system was somewhat deficient.

The depth of snow on the ground at the end of the month is shown on Chart IX. The snow covering was heaviest in New England, the upper Mississippi Valley, and in the mountain regions of Colorado, California, and Idaho. The snow covering was very light in the Ohio Valley, throughout Indiana, Illinois, Missouri, western Kansas, Nebraska, South Dakota, western North Dakota, and Montana.

HUMIDITY.

The humidity observations of the Weather Bureau are divided into two series; the first or tridaily series began in

1871 and ended with 1887; the second or twice-daily series is continuous from 1888 to the present time.

The monthly means of the second or present series are based upon observations of the whirled psychrometer at 8 a. m. and 8 p. m., seventy-fifth meridian time, which corresponds to 5 a. m. and 5 p. m., Pacific; 6 a. m. and 6 p. m., Mountain; and 7 a. m. and 7 p. m., Central standard time.

Mean values computed from the first series are naturally not directly comparable with those of the second. In general the means of the first series are lower than those of the second, since they include an observation in the afternoon when the relative humidity of the air is near the minimum of the day. At stations in the western plateau region, however, the converse holds good, the means of the second series being lower than those of the first by amounts ranging from 0 to 10 per cent on the average of the year.

In the present state of knowledge respecting the diurnal variation in the moisture of the air, we are scarcely warranted in combining the two series in a general mean.

The current month.—The relative humidity was above the normal in six districts, exactly normal in 4, and below in the remaining eleven.

The greatest contrast between the relative humidity of adjoining geographic districts obtained in the Plateau region. The relative humidity of the southern Plateau, embracing in the latter designation the eastern half of California below the thirty-seventh parallel, all of Arizona, and the western half of New Mexico, was 10 per cent below normal, while the middle Plateau, immediately to the northward, was 4 per cent above, and the northern Plateau, still farther north, was 7 per cent above the normal.

The relative humidity of the middle and south Pacific coast was 8 and 11 per cent below normal, respectively. Dry northerly and northwesterly winds prevailed throughout the month.

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	80	+ 2	Missouri Valley	65	- 6
Middle Atlantic	76	0	Northern Slope	66	0
South Atlantic	77	- 2	Middle Slope	61	- 1
Florida Peninsula	80	- 1	Southern Slope	60	- 1
East Gulf	77	0	Southern Plateau	36	-10
West Gulf	74	+ 1	Middle Plateau	58	+ 4
Ohio Valley and Tennessee	74	+ 1	Northern Plateau	80	+ 7
Lower Lake	75	- 1	North Pacific Coast	86	- 1
Upper Lake	82	+ 2	Middle Pacific Coast	65	- 8
North Dakota	79	0	South Pacific Coast	56	-11
Upper Mississippi Valley	73	- 1			

In using the table by means of which the amount of moisture in the air is computed from the readings of the wet and dry bulb thermometers, the pressure argument has almost always been neglected, an omission that has little significance except for low temperatures and at high stations, such as Santa Fe, El Paso, Cheyenne, and a few others. The failure to apply a correction for the influence of pressure on the evaporation and therefore on the temperature of the wet-bulb thermometer has had the effect of making the monthly means of relative humidity at high-level stations too small by quantities ranging from 5 to 10 per cent. In the application of the monthly averages of the above table, or those of individual stations in Table I, to special inquiries, whether in the departments of biology, climatology, or sanitary science, this fact should be kept in mind. It should also be remembered that the hours at which observations in the Rocky Mountain Plateau region are made, viz, at 5 or 6 local mean time, morning and afternoon, give approximately the maximum and minimum values of the relative humidity for the day;

probably the means of such hours approach more nearly the true mean of the month than is the case on the Atlantic seaboard and in the seventy-fifth meridian time belt.

WIND.

The maximum wind velocity at each Weather Bureau station for a period of five minutes is given in Table I, which also gives the altitude of Weather Bureau anemometers above ground.

Following are the velocities of 50 miles and over per hour registered during the month:

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Amarillo, Tex.	21	68	n.	Havre, Mont.	6	52	nw.
Block Island, R. I.	26	76	ne.	Memphis, Tenn.	5	50	w.
Do.	27	90	ne.	Do.	21	52	sw.
Boston, Mass.	27	60	ne.	Mount Tamalpais, Cal.	6	62	nw.
Buffalo, N. Y.	5	68	w.	Do.	7	82	nw.
Do.	6	63	w.	Do.	19	83	nw.
Do.	15	50	w.	Do.	20	54	nw.
Do.	22	54	w.	Do.	29	61	sw.
Do.	23	50	sw.	Nantucket, Mass.	26	57	e.
Cape May, N. J.	27	55	nw.	Do.	27	72	ne.
Cheyenne, Wyo.	4	54	nw.	Neab. Wash.	2	60	sw.
Chicago, Ill.	4	58	s.	New York, N. Y.	6	50	nw.
Do.	5	52	w.	Do.	7	52	nw.
Do.	7	76	s.	Do.	11	65	nw.
Do.	9	50	ne.	Do.	20	59	nw.
Do.	10	61	ne.	Do.	25	60	w.
Cleveland, Ohio	11	52	w.	Do.	26	54	nw.
Denver, Colo.	28	50	nw.	Do.	27	64	nw.
Duluth, Minn.	21	58	nw.	Do.	28	54	w.
Do.	22	50	nw.	Pierre, S. D.	20	52	nw.
Eastport, Me.	27	52	ne.	Do.	21	59	nw.
El Paso, Tex.	20	64	sw.	Port Huron, Mich.	10	52	n.
Fort Canby, Wash.	2	60	se.	Pueblo, Colo.	20	52	n.
Do.	16	63	s.	St. Louis, Mo.	21	58	sw.
Do.	21	60	s.	Sioux City, Iowa	5	50	nw.
Do.	27	69	se.	Do.	21	58	nw.
Do.	30	58	se.	Do.	22	60	n.
Hatteras, N. C.	19	52	w.	Vicksburg, Miss.	21	50	nw.
Do.	26	56	nw.	Woods Hole, Mass.	11	50	nw.
Do.	27	52	nw.	Do.	27	78	n.

The winds were more boisterous than usual east of the Rocky Mountains, and especially on the north Atlantic coast. The great destruction of life and property on the New England coast on November 26-27, elsewhere referred to in this REVIEW, was not wholly due to the wind, although velocities higher than ever before recorded were registered at three stations, viz, Block Island, R. I., where the anemometer was blown down by a 90-mile per hour wind, the highest previous velocity during seventeen years being 84 miles per hour. Woods Hole with a velocity of 78 miles per hour; highest previous velocity in eighteen years, 72 miles. Nantucket, maximum velocity, 72 miles; highest previous velocity, eleven years record, 62 miles.

In comparison with the storm above referred to all others that occurred during the month seem insignificant. There were, however, three dates upon which the winds at interior points were severe, as follows:

5th. Severe local storms occurred in Ohio, Indiana, and Kentucky. Near Circleville, Ohio, a large barn was blown down killing one person and injuring another. A small local whirlwind or miniature tornado caused the destruction of fences and prostrated trees near the village of Summit, Cook County, Ill. The path of the storm was a mile and a half long and a few feet wide. A man was injured by trees falling upon him.

21st-22d. The winds were very high over a large extent of territory on these dates. A north wind of 68 miles per hour was experienced at Amarillo, Tex.; a southwest wind of 52 miles per hour at Memphis, Tenn.; a northwest wind of 50 miles at Vicksburg, Miss.; a northwest wind of 58 miles at Sioux City, Iowa; and a northwest wind of 56 miles at Duluth,

Minn. Other high winds were registered, as may be seen by an inspection of the table above. Telegraph and telephone wires, and, in some cases, transportation lines suffered on account of the drifting snow and high winds. Losses were also reported from the cattle and sheep raising districts of Oklahoma, Indian Territory, and Texas. The temperature fell as much as 60° in a short time at a number of places.

25-26th. The storm of the 25-26th proved very disastrous to shipping on Lakes Superior and Michigan, not so much by reason of the wind as on account of the heavy snow that fell in connection therewith. An account of disasters to vessels during this storm was published on the Meteorological Chart of the Great Lakes.

The total wind travel during the month was above 10,000 miles at 13 stations, as may be seen by an examination of Table I. The station having the greatest wind travel was Chicago, with 15,250 miles, closely followed by Mount Tamalpais, Cal., with 15,191 miles.

SUNSHINE AND CLOUDINESS.

The quantity of sunshine, and therefore of heat, received by the atmosphere as a whole is very nearly constant from year to year, but the proportion received by the surface of the earth depends upon the absorption by the atmosphere, and varies largely with the distribution of cloudiness. The sunshine is now recorded automatically at 21 regular stations of the Weather Bureau by its photographic and at 47 by its thermal effects. The photographic record sheets show the apparent solar time, but the thermometric records show seventy-fifth meridian time; for convenience the results are all given in Table IX for each hour of local mean time. In order to complete the record of the duration of cloudiness these registers are supplemented by special personal observations of the state of the sky near the sun for an hour after sunrise and before sunset, and the cloudiness for these hours has been added as a correction to the instrumental records, whence there results a complete record of the duration of sunshine from sunrise to sunset.

The average cloudiness of the whole sky is determined by numerous personal observations at all stations during the daytime, and is given in the column "average cloudiness" in Table I; its complement, or percentage of clear sky, is given in the last column of Table IX for the stations at which instrumental self-registers are maintained.

The percentage of clear sky (sunshine) for all of the stations included in Table I, obtained as described in the preceding paragraph, is graphically shown on Chart VII. The regions of cloudy and overcast skies are shown by heavy shading; an absence of shading indicates, of course, the prevalence of clear, sunshiny weather.

The formation of fog and cloud is primarily due to differences of temperature in a relatively thin layer of air next to the earth's surface. The relative position of land and water surfaces often greatly increases the tendency to form areas of cloud and fog. This principle is perhaps better exemplified in the Lake region than elsewhere, although it is of quite general application. The percentage of sunshine on the lee shores of the Lakes is always much less than on the windward shores. Next to the permanent influences that tend to form fog and cloud may be classed the frequency of the passage of cyclonic areas.

The current month.—There was more than the normal cloudiness, and consequently less than the normal sunshine in 13 geographical districts, less than normal in 6, and exactly normal in the remaining 2 districts. In the 13 districts of diminished sunshine the temperature was below normal in 11, above in 1, and exactly normal in 1. In the 6 districts of increased sunshine, and consequently increased inso-

lation, temperature was below normal in 4, above in 1, and exactly normal in 1.

That temperature is not always controlled by insolation seems evident from the above. The station having the greatest sunshine, Yuma, Ariz., 91 per cent, had also a temperature 1.5° below normal, while the station having the next to the least sunshine, Eastport, Me., 14 per cent, had at the same time a temperature 2.3° above normal. The low temperature at Yuma might be explained by the fact that two-thirds of the observed winds were from a northerly, and consequently colder quarter, while but one-tenth was from a southerly or warmer quarter. At Eastport much the same conditions prevailed, but with different results as to temperature; 50 per cent of the observed winds were from a northerly quarter, and but 23 per cent from a southerly quarter. We must assume that in the latter case the local winds at Eastport were but a part of a much larger mass of air of relatively higher temperature than usual, and this seems to have been the case. (See remarks of Prof. R. F. Stupart, page 499, of this REVIEW.)

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	6.3	+0.7	Missouri Valley	4.7	-0.2
Middle Atlantic	5.8	+0.6	Northern Slope	4.6	0.0
South Atlantic	5.1	+0.6	Middle Slope	4.0	+0.4
Florida Peninsula	5.0	+0.4	Southern Slope	3.8	+0.6
East Gulf	5.3	+0.8	Southern Plateau	1.9	-0.4
West Gulf	5.3	+0.7	Middle Plateau	4.8	+1.2
Ohio Valley and Tennessee	3.8	+0.1	Northern Plateau	7.2	+1.2
Lower Lake	7.2	0.0	North Pacific Coast	7.6	+0.8
Upper Lake	6.7	-0.3	Middle Pacific Coast	4.3	+0.5
North Dakota	4.8	-0.5	South Pacific Coast	2.0	-0.9
Upper Mississippi Valley	4.9	-0.4			

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table IX, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and

auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—Three hundred and thirty-three reports of thunderstorms were received during the current month as against 511 in 1897, and 619 during the preceding month.

The dates on which the number of reports of thunderstorms for the whole country were most numerous were: 5th, 133; 21st, 29; 4th, 27; 9th, 25.

Reports were most numerous from Ohio, 48; Illinois, 40; Louisiana, 33; Missouri, 23.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, 1st, and from the 23d to the 30th.

The greatest number of reports were received for the following dates: 11th, 10; 3d and 21st, 5; 14th, 4.

Reports were most numerous from Montana, 11; Ohio, 7; North Dakota and Wisconsin, 5.

In Canada.—Auroras were reported as follows: Father Point, 3, 11, 21; Quebec, 2, 3, 11, 21; Port Arthur, 12; Minnedosa, 13, 21, 22; Qu'Appelle, 20, 21, 22; Swift Current, 21, 22; Battleford, 22, 23, 24; Prince Albert, 21, 22, 23.

The only thunderstorm reported was from Yarmouth, 6th.

NOTES ON THE WEATHER OF THE WEST INDIES.

The weather was generally tranquil at all stations. A small disturbance was reported near Trinidad on the 6th, but it apparently disappeared by the morning of the 7th.

Thunderstorms were observed as follows: Colon, 3d, 12th, 14th, 16th, 19th; Bridgetown, 10th, 11th; Curaçao, 6th, 8th, 9th.

Nephoscope observations were generally begun during the month.

The telegraphing of weather reports for the season ceased on the 16th.

At this writing (January 6, 1899) the regular monthly reports for November from Kingston, Santiago, Santo Domingo, and Port of Spain have not been received.

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts relating to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective sections of the Climate and Crop Service. The name of the section director is given after each summary.

Rainfall is expressed in inches.

Alabama.—The mean temperature was 50.2° , or 3.3° below normal; the highest was 87° , at Goodwater on the 6th, and the lowest, 12° , at Oneonta on the 27th. The average precipitation was 5.60, or 2.64 above normal; the greatest monthly amount, 9.78, occurred at Healing Springs, and the least, 1.61, at Valleyhead.—*F. P. Chaffee.*

Arizona.—The mean temperature was 51.5° , or 1.0° below normal; the highest was 96° , at Parker on the 6th, and the lowest, 3° , at Flagstaff on the 9th and 12th. The average precipitation was 0.56 or 0.14 below normal; the greatest monthly amount, 1.75, occurred at Lochiel, and the least, trace, at Benson, Fort Mohave, Gila Bend, and Winslow.—*W. G. Burns.*

Arkansas.—The mean temperature was 47.5° , or 3.2° below normal, and is the lowest for November on record; the highest was 87° , at Stamps on the 5th, and the lowest, 9° , at Mossville on the 22d, and at Winslow on the 23d. The average precipitation was 3.20, or 0.98 below normal; the greatest monthly amount, 6.46, occurred at Elon, and the least, 1.50, at Lacrosse.—*E. B. Richards.*

California.—The mean temperature was 51.6° , or 1.3° below normal; the highest was 102° , at Pomona on the 7th, and the lowest, 11° below

zero, at Bodie on the 25th. The average precipitation was 0.99, or 1.20 below normal; the greatest monthly amount, 9.98, occurred at Crescent City, while none fell at many stations.—*W. H. Hammon.*

Colorado.—The mean temperature was 31.2° , or 3.1° below normal; the highest was 85° , at Minneapolis on the 7th, and the lowest, 20° below zero, at Breckenridge on the 22d. The average precipitation was 0.98, or 0.22 above normal; the greatest monthly amount, 4.14, occurred at Ruby, and the least, trace, at Hugo and Las Animas.—*F. H. Brandenburg.*

Florida.—The mean temperature was 65.0° , or normal; the highest was 94° , at Lakemont on the 4th and 5th, and the lowest, 30° , at Wausau on the 24th and 30th. The average precipitation was 2.57, or about normal; the greatest monthly amount, 7.53, occurred at De Funiak Springs, and the least, 0.40, at Lemon City.—*A. J. Mitchell.*

Georgia.—The mean temperature was 51.4° , or 3.1° below normal; the highest was 89° , at Hawkinsville on the 6th, and the lowest, 11° , at Diamond on the 27th. The average precipitation was 4.99, or 2.74 above normal; the greatest monthly amount, 7.90, occurred at Blakely, and the least, 2.96, at Cedartown.—*J. B. Marbury.*

Illinois.—The mean temperature was 38.0° , or 1.1° below normal; the highest was 80° , at Danville on the 4th, and the lowest, 6° below zero, at Lanark and Scales Mound on the 27th. The average precipitation was 2.21, or 0.73 below normal; the greatest monthly amount, 4.24, occurred at Atwood, and the least, 0.99, at New Burnside. Winter wheat and rye have made a heavy growth and are strong, vigorous, and well rooted. The growth has been so rank in many counties that wheat has been pastured. Generally the plants are in fine condition, although some damage by hessian fly is reported from central and southern counties.—*C. E. Linney.*

Indiana.—The mean temperature was 38.8°, or 2.1° below normal; the highest was 76°, at Washington on the 3d and 21st, and the lowest, zero, at Lafayette on the 26th. The average precipitation was 2.87, or 1.00 below normal; the greatest monthly amount, 4.66, occurred at Angola, and the least, 0.60, at Valparaiso. The weather during the month was quite favorable to winter crops. During colder weather near the end of the month they were well protected by snow covering in the central and northern portions, but in the southern portion, less snow having fallen, the crops suffered in some fields during the freezing weather. Wheat continued to be in good condition for wintering; it is deep rooted and vigorous, but rank in some fields.—*C. F. R. Wapenhans.*

Iowa.—The mean temperature was 32.2°, or slightly below normal; the highest was 78°, at Corning on the 3d, and the lowest, 17° below zero, at Spirit Lake on the 22d and at Algona on the 26th. The average precipitation was 1.46, or slightly below normal; the greatest monthly amount, 3.61, occurred at Indianola, and the least, 0.33, at What Cheer.—*G. M. Chappel.*

Kansas.—The mean temperature was 39.7°, or 1.6° below normal; the highest was 89°, at Medicine Lodge on the 4th, and the lowest, 10° below zero, at Wallace on the 22d and at Frankfort on the 23d. The average precipitation was 1.10, or 0.20 above normal; the greatest monthly amount, 2.25, occurred at Lebo, and the least, trace, at Coolidge and Wallace.—*T. B. Jennings.*

Kentucky.—The mean temperature was 43.5°, or 1.8° below normal; the highest was 80°, at Lyndon on the 4th, and the lowest, 10°, at Irvington and Shelby City on the 27th. The average precipitation was 2.79, or 1.32 below normal; the greatest monthly amount, 4.32, occurred at Alpha, and the least, 1.51, at Henderson. The weather was generally favorable to wheat, and it is reported in good condition.—*H. B. Hersey.*

Louisiana.—The mean temperature was 54.0°, or 4.0° below normal; the highest was 87°, at White Sulphur Springs on the 4th, and the lowest, 16°, at the same station on the 24th. The average precipitation was 6.96, or 3.16 above normal; the greatest monthly amount, 12.93, occurred at Donaldsonville, and the least, 4.28, at Shreveport.—*A. G. McAdie.*

Maryland and Delaware.—The mean temperature was 43.4°, or 1.9° below normal; the highest was 78°, at Pocomoke City, Md., on the 10th, and the lowest, 6° below zero, at Deep Park, Md., on the 28th. The average precipitation was 3.85, or 0.80 above normal; the greatest monthly amount, 5.62, occurred at Darlington, Md., and the least, 1.42, at Boettcherville, Md.—*F. J. Walz.*

Michigan.—The month was warmer than usual in the upper peninsula and in the northern counties; in the central counties there was a slight deficiency in temperature, while in the southern counties the temperature was 1.6° below normal; the highest was 73°, at Midland on the 4th, and the lowest, 7° below zero, at Humboldt on the 25th. The average precipitation was slightly below normal; the greatest monthly amount, 4.46, occurred at Coldwater, and the least, 0.75, at Lathrop.—*C. F. Schneider.*

Minnesota.—The mean temperature was 26.6°, or about normal; the highest was 69°, at Two Harbors on the 4th, and the lowest, 31° below zero, at Pokegama on the 24th. The average precipitation was 1.02, or about normal; the greatest monthly amount, 2.70, occurred at Willow River, and the least, 0.15, at Pipestone.—*T. S. Outram.*

Mississippi.—The mean temperature was 50.9°, or about 3.0° below normal; the highest was 88°, at Natchez on the 5th, and the lowest, 16°, at French Camp on the 22d and 23d. The average precipitation was 4.97, or 2.52 above normal; the greatest monthly amount, 9.60, occurred at Waynesboro, and the least, 2.27, at Hernando.—*W. T. Blythe.*

Missouri.—The mean temperature was 39.9°, or 2.3° below normal; the highest was 79°, at Marshall on the 7th, and the lowest, 8° below zero, at Pickering on the 23d. The average precipitation was 2.30, or about normal; the greatest monthly amount, 4.31, occurred at Appleton City, and the least, 0.85, at Conception. Alternate freezing and thawing, and the unusually low temperatures of the last decade of the month, were injurious to winter wheat, especially the late sown in those sections where there was little or no snow to protect it. The greater part of the crop, however, has made good growth during the fall and went into winter in good condition.—*A. E. Hackett.*

Montana.—The mean temperature was 27.8°, or about normal; the highest was 68°, at Crow Agency on the 6th, and the lowest, 24° below zero, at Manhattan on the 21st. The average precipitation was 0.76, or 0.33 below normal; the greatest monthly amount, 2.04, occurred at Fort Logan, and the least, 0.04, at Darby.—*E. J. Glass.*

Nebraska.—The mean temperature was 31.4°, or about 3.0° below normal; the highest was 81°, at Lynch on the 4th, and the lowest, 15° below zero, at Valentine on the 22d. The average precipitation was 0.57, or about 0.10 below normal; the greatest monthly amount, 1.60, occurred at Kimball, and the least, trace, at several southwestern stations.—*G. A. Loveland.*

Nevada.—The mean temperature was 35.1°, or about 3.0° below normal; the highest was 77°, at Candelaria on the 5th, and the lowest, 10° below zero, at Wells on the 24th. The average precipitation was 1.10, or 0.37 above normal; the greatest monthly amount, 5.95, occurred at Clover Valley, and the least, trace, at several stations.—*R. F. Young.*

New England.—The mean temperature was 37.7°, or about normal; the highest was 67°, at Lake Cochituate, Mass., on the 4th, and at Voluntown, Conn., on the 5th; and the lowest, 3° below zero, at Enosburg Falls, Vt., on the 26th. The average precipitation was 5.68 or 1.82 above normal; the greatest monthly amount, 11.01, occurred at Vineyard Haven, Mass., and the least, 1.30, at Cornwall, Vt.—*J. W. Smith.*

New Jersey.—The mean temperature was 42.4°, or 0.9° below normal; the highest was 70°, at Bridgeton on the 5th, at Cape May C. H. on the 9th, and at Woodbine on the 10th; the lowest was 11°, at Chester on the 26th. The average precipitation was 6.76, or 3.10 above normal; the greatest monthly amount, 9.07, occurred at Moorestown, and the least, 3.83, at Cape May City.—*E. W. McGann.*

New Mexico.—The mean temperature was 40.3°, or about 2.0° below normal; the highest was 85°, at Roswell on the 7th, and the lowest, 12° below zero, at Monero on the 22d. The average precipitation was 0.65, or about 0.20 above normal; the greatest monthly amount, 2.60, occurred at Fort Wingate, and the least, trace, at Rincon.—*R. M. Hardinge.*

New York.—The mean temperature was 38.1°, or 0.3° above normal; the highest was 75°, at Cedarhill on the 5th, and the lowest, 2° below zero, at Saranac Lake on the 27th. The average precipitation was 3.92, or 0.71 above normal; the greatest monthly amount, 8.90, occurred at Brentwood, and the least, 0.58, at Ogdensburg.—*R. G. Allen.*

North Carolina.—The mean temperature was 47.2°, or about 2.5° below normal; the highest was 81°, at Pittsboro on the 10th, and the lowest, 8°, at Highlands on the 27th. The average precipitation was 3.24, or about normal; the greatest monthly amount, 8.47, occurred at Highlands, and the least, 1.65, at Marshall.—*C. F. von Herrmann.*

North Dakota.—The mean temperature was 22.6°, or 2.9° below normal; the highest was 69°, at Fort Yates on the 1st, and the lowest, 30° below zero, at McKinney on the 23d. The average precipitation was 0.37, or 0.58 below normal; the greatest monthly amount, 1.19, occurred at Hamilton, and the least, trace, at Ellendale, Steele, and University.—*B. H. Bronson.*

Ohio.—The mean temperature was 38.8°, or 1.8° below normal; the highest was 76°, at Upper Sandusky on the 3d, and the lowest, 2°, at Millport on the 28th. The average precipitation was 3.17, or 0.21 below normal; the greatest monthly amount, 5.52, occurred at Levering, and the least, 2.01, at Demos. Fall sown grains made a good growth, and where not damaged by fly and grubworm the fields are more promising than usual at this season of the year.—*J. Warren Smith.*

Oklahoma.—The mean temperature was 45.6°; the highest was 88°, at Healdton, Chickasaw Nation, on the 19th, and the lowest, 5°, at Norman on the 23d. The average precipitation was 1.04; the greatest monthly amount, 2.36, occurred at Tahlequah, and the least, 0.44, at Woodward. Throughout the eastern section and portions of central and northern sections winter wheat is in very fair condition and has afforded good pastures. Throughout the south, west, and northwest the ground has been too dry and wheat is not looking so well. Throughout these sections the absence of sufficient rain during the planting season prevented as much ground being sown as had been prepared. Most of the ground remaining unplanted at close of October was seeded this month.—*J. I. Widmeyer.*

Oregon.—The mean temperature was 41.0°, or 2.3° below normal; the highest was 73°, at Langlois on the 13th, at Prineville on the 24th, and at Toledo on the 1st; the lowest was zero, at Silverlake on the 8th. The average precipitation was 6.76, or 1.57 above normal; the greatest monthly amount, 19.83, occurred at Government Camp, and the least, 1.01, at Dayville. The weather conditions were very favorable for plowing and seeding. The grain sown in the dust east of the Cascades was well packed down by the November rains, and by the close of the month it had made a good growth. Those east of the Cascades who waited for rains before seeding have been delayed in their work. Owing to the active prosecution of work, a much larger acreage than usual has been sown.—*B. S. Pague.*

Pennsylvania.—The mean temperature was 40.0°, or 0.4° above normal; the highest was 73°, at Johnstown on the 4th, and the lowest, 2°, at Saegertown on the 28th. The average precipitation was 4.03, or 0.89 above normal; the greatest monthly amount, 7.34, occurred at Quakertown, and the least, 1.44, at Hollidaysburg.—*T. F. Townsend.*

South Carolina.—The mean temperature was 51.0°, or 4.1° below normal; the highest was 82°, at Shaws Fork on the 9th, and the lowest, 14°, at Clemson College on the 27th. The average precipitation was 4.72, or 2.11 above normal; the greatest monthly amount, 6.41, occurred at Gillisonville, and the least, 2.58, at Yorkville. Much wheat and oats were sown, but the soil was too wet in places for this work. The cool weather was, however, favorable for grain that was up, but retarded germination of that recently sown.—*J. W. Bauer.*

South Dakota.—The mean temperature was 27.4°, or about 4.0° below normal; the highest was 80°, at Cherry Creek, on the 6th, and the lowest, 21° below zero, at Ashcroft on the 21st. The average precipitation was 0.28, or 0.31 below normal; the greatest monthly amount, 1.03, occurred at Rockford, and the least, trace, at Shiloh and Wessington Springs.—*S. W. Glenn.*

Tennessee.—The mean temperature was 45.3°, or about 1.8° below normal; the highest was 80°, at Madison on the 4th, and the lowest, 6°, at

at Erasmus on the 27th. The average precipitation was 3.34, or about 0.50 below normal; the greatest monthly amount, 5.83, occurred at Sylvia, and the least, 1.73, at Silverlake. The weather was unfavorable for farm work, especially the seeding of winter wheat.—*H. C. Bate.*

Texas.—The mean temperature for the State, determined by comparison of 35 stations distributed throughout the State, was 3.4 below the normal. There was a general deficiency ranging from 1.0° to 6.2°, with the greatest over east Texas and the coast district. The highest was 98°, at Fort Ringgold on the 5th and at Fort McIntosh on the 7th, and the lowest, 13°, at Amarillo on the 22d. The average precipitation for the State, determined by comparison of 36 stations distributed throughout the State, was 0.19 below the normal. Nearly normal conditions prevailed over the panhandle. There was a slight deficiency over east, central, southwest, and west Texas, and the western portion of north Texas, and a deficiency of more than 1.00 over the eastern portion of north Texas, while there was a general excess over the coast district. The greatest monthly amount, 5.97, occurred at Jasper, while none fell at Menardville and Sanderson. Much wheat was sown during the month and the showers at the opening of the second decade were very beneficial for the crop. Early sown wheat suffered for rain at the opening of the month and some died, leaving a poor stand in localities over the western portion of the wheat belt.—*I. M. Cline.*

Utah.—The mean temperature was 35.4°; the highest was 82°, at Moab on the 7th, and the lowest, 8° below zero, at Woodruff on the 20th.

The average precipitation was slightly above normal; the greatest monthly amount, 3.44, occurred at Huntsville, and the least, trace, at Pahreah, St. George, and Tropic.—*J. H. Smith.*

Virginia.—The mean temperature was 44.6°, or about 2.5° below normal; the highest was 80°, at Wytheville on the 3d, and the lowest, 6°, at Burkes Garden on the 28th. The average precipitation was 2.59, or 0.11 above normal; the greatest monthly amount, 4.77, occurred at Spottsville, and the least, 1.50, at Salem.—*E. A. Evans.*

Washington.—The mean temperature was 39.8°, or 1.5° below normal; the highest was 75°, at Bridgeport on the 1st, and the lowest, 8°, at Waterville on the 16th. The average precipitation was 5.35, or 0.80 below normal; the greatest monthly amount, 15.60, occurred at Neah, and the least, trace, at Bridgeport.—*G. N. Salisbury.*

Wisconsin.—The mean temperature was 32.2°, or slightly above normal; the highest was 72°, at Knapp on the 3d, and the lowest, 34° below zero, at Osceola on the 24th. The average precipitation was 1.34, or 0.35 below normal; the greatest monthly amount, 2.45, occurred at Medford, and the least, 0.38, at Chilton.—*W. M. Wilson.*

Wyoming.—The mean temperature was 28.2°, or 3.2° below normal; the highest was 76°, at Fort Laramie on the 1st, and the lowest, 20° below zero, at Lovell on the 21st. The average precipitation was 0.83, or 0.07 above normal; the greatest monthly amount, 2.10, occurred at Evanston, and the least, 0.03, at Fort Washakie.—*W. S. Paemer.*

SPECIAL CONTRIBUTIONS.

NOTES BY THE EDITOR.

Owing to sickness these sections are omitted in order that the REVIEW may be published on time.

METEOROLOGICAL TABLES AND CHARTS.

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

Table I gives, for about 130 Weather Bureau stations making two observations daily and for about 20 others making only one observation, the data ordinarily needed for climatological studies, viz, the monthly mean pressure, the monthly means and extremes of temperature, the average conditions as to moisture, cloudiness, movement of the wind, and the departures from normals in the case of pressure, temperature, and precipitation, the total depth of snowfall, and the mean wet-bulb temperatures. The altitudes of the instruments above ground are also given.

Table II gives, for about 2,700 stations occupied by voluntary observers, the highest maximum and the lowest minimum temperatures, the mean temperature deduced from the average of all the daily maxima and minima, or other readings, as indicated by the numeral following the name of the station; the total monthly precipitation, and the total depth in inches of any snow that may have fallen. When the spaces in the snow column are left blank it indicates that no snow has fallen, but when it is possible that there may have been snow of which no record has been made, that fact is indicated by leaders, thus (....).

Table III gives, for about 30 stations furnished by the Canadian Meteorological Service, Prof. R. F. Stupart, director, the means of pressure and temperature, total precipitation and depth of snowfall, and the respective departures from normal values, except in the case of snowfall.

Table IV gives, for 26 stations selected out of 113 that maintain continuous records, the mean hourly temperatures deduced from the Richard thermographs described and figured in the Report of the Chief of the Weather Bureau, 1891-92, p. 29.

Table V gives, for 26 stations selected out of 104 that maintain continuous records, the mean hourly pressures as auto-

matically registered by Richard barographs, except for Washington, D. C., where Foreman's barograph is in use. Both instruments are described in the Report of the Chief of the Weather Bureau, 1891-92, pp. 26 and 30.

Table VI gives, for about 130 stations, the arithmetical means of the hourly movements of the wind ending with the respective hours, as registered automatically by the Robinson anemometer, in conjunction with an electrical recording mechanism, described and illustrated in the Report of the Chief of the Weather Bureau, 1891-92, p. 19.

Table VII gives, for all stations that make observations at 8 a. m. and 8 p. m., the four component directions and the resultant directions based on these two observations only and without considering the velocity of the wind. The total movement for the whole month, as read from the dial of the Robinson anemometer, is given for each station in Table I. By adding the four components for the stations comprised in any geographical division the average resultant direction for that division can be obtained.

Table VIII gives the total number of stations in each State from which meteorological reports of any kind have been received, and the number of such stations reporting thunderstorms (T) and auroras (A) on each day of the current month.

Table IX gives, for about 70 stations, the average hourly sunshine (in percentages) as derived from the automatic records made by two essentially different types of instruments, designated, respectively, the thermometric recorder and the photographic recorder. The kind of instrument used at each station is indicated in the table by the letter T or P in the column following the name of the station.

Table X gives a record of rains whose intensity at some

period of the storm's continuance equaled or exceeded the following rates:

Duration, minutes..	5	10	15	20	25	30	35	40	45	50	60	80	100	120
Rates pr. hr. (ins.)..	3.00	1.80	1.40	1.20	1.08	1.00	0.94	0.90	0.86	0.84	0.75	0.60	0.54	0.50

In the northern part of the United States, especially in the colder months of the year, rains of the intensities shown in the above table seldom occur. In all cases where no storm of sufficient intensity to entitle it to a place in the full table has occurred, the greatest rainfall of any single storm has been given, also the greatest hourly fall during that storm.

Table XI gives the record of excessive precipitation at all stations from which reports are received.

NOTES EXPLANATORY OF THE CHARTS.

Chart I.—Tracks of centers of high areas. The roman letters show number and order of centers of high areas. The figures within the circles show the days of the month; the letters *a* and *p* indicate, respectively, the 8 a. m. and 8 p. m., seventy-fifth meridian time, observations. The queries (?) on the tracks show that the centers could not be satisfactorily located. Within each circle is given the highest barometric reading reported near the center. A blank indicates that no reports were available. A wavy line indicates the axis of a ridge of high pressure.

Chart II.—Tracks of centers of low areas. The roman letters show number and order of centers of low areas. The figures within the circles show the days of the month; the letters *a* and *p* indicate, respectively, the 8 a. m. and 8 p. m., seventy-fifth meridian time, observations. The queries (?) on the tracks show that the centers could not be satisfactorily located. Within each circle is given the lowest barometric reading reported near the center. A blank indicates that no reports were available. A wavy line indicates the axis of a trough or long oval area of low pressure.

Chart III.—Total precipitation. The scale of shades show-

ing the depth of rainfall is given on the chart itself. For isolated stations the rainfall is given in inches and tenths, when appreciable; otherwise, a "trace" is indicated by a capital T, and no rain at all, by 0.0.

Chart IV.—Sea-level isobars and isotherms, and resultant winds. The wind directions on this Chart are the computed resultants of observations at 8 a. m. and 8 p. m., daily; the resultant duration is shown by figures attached to each arrow. The temperatures are the means of daily maxima and minima and are reduced to sea level. The pressures are the means of 8 a. m. and 8 p. m. observations, daily, and are reduced to sea level and to standard gravity. The reduction for 30 inches of the mercurial barometer, as formerly shown by the marginal figures for each degree of latitude, has already been applied.

Chart V.—Hydrographs for seven principal rivers of the United States.

Chart VI.—Surface temperatures; maximum, minimum, and mean. Lines of equal monthly mean temperature in red; lines of equal maximum temperature in black; and lines of equal minimum temperature (dotted) also in black.

Chart VII.—Percentage of sunshine. The average cloudiness at each Weather Bureau station is determined by numerous personal observations during the day. The difference between the observed cloudiness and 100, it is assumed, represents the percentage of sunshine, and the values thus obtained have been used in preparing Chart VII.

Chart VIII.—The total snowfall. This is based on the reports from all available observers and shows the depth of the snowfall during the month in inches. In general, the depth is shown by lines and areas of equal snowfall, but in some cases figures are also given for special localities.

Chart IX.—Depth of snow on ground. This chart is based essentially upon reports from regular and special observers and shows the depth of snow lying on the ground at the end of the month, which is, therefore, the accumulated excess of the snowfall over its loss by melting, evaporation, and settling.

TABLE I.—Climatological data for Weather Bureau Stations, November, 1898.

Stations.	Elevation of instruments.		Pressure, in inches.		Temperature of the air, in degrees Fahrenheit.								Precipitation, in inches.		Wind.				Total snowfall.									
	Barometer above sea level, feet.	Thermometers above ground.	Anemometer above ground.	Mean actual, 8 a. m. and 8 p. m. + 2.	Mean reduced.	Departure from normal.	Mean max. and min. + 2.	Departure from normal.	Maximum.	Date.	Mean minimum.	Greatest daily range.	Mean wet thermometer.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Total.	Departure from normal.	Days with .01 or more.		Total movement, miles.	Prevailing direction.	Maximum velocity.	Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.		
New England.																												
Eastport.....	76	69	74	29.86	29.95	-.02	41.1	39.0	55	6	44	18	35	35	80	6.21	+.2	15	10,449	n.	52	ne.	27	4	5	23	8.6	10.8
Portland, Me.....	103	81	89	29.86	29.97	+.04	38.6	34.6	56	6	45	18	35	35	79	5.51	+.1	13	6,084	n.	42	ne.	27	4	10	16	6.7	22.2
Northfield.....	872	15	65	29.09	30.07	+.03	32.4	24.0	61	6	40	1	26	32	78	1.97	+.3	10	6,944	s.	42	sw.	6	4	10	16	6.9	13.3
Boston.....	125	115	181	29.87	30.01	+.02	42.0	42.0	63	2	48	36	42	48	84	5.32	+.8	13	8,988	nw.	60	n.	27	12	4	14	5.9	17.1
Nantucket.....	14	43	54	29.98	29.99	-.08	44.8	44.0	61	11	50	24	32	40	84	5.15	+.6	14	9,868	nw.	72	n.	27	12	7	10	6.9	1.5
Woods Hole.....	22	51	57	29.98	29.99	-.02	44.0	44.0	62	6	48	24	32	40	84	5.15	+.6	14	9,868	nw.	72	n.	27	15	2	13	5.0	17.1
Vineyard Haven.....	30	51	57	29.98	29.99	-.02	44.0	45.0	61	6	45	24	32	39	83	5.15	+.6	14	9,868	nw.	72	n.	27	15	2	13	5.0	17.1
Block Island.....	27	39	48	29.99	30.02	+.04	43.6	43.6	61	6	45	24	32	39	83	5.15	+.6	14	9,868	nw.	72	n.	27	15	2	13	5.0	17.1
Narragansett.....	10	51	57	29.98	29.99	-.02	44.0	40.6	61	6	48	24	32	39	83	5.15	+.6	14	9,868	nw.	72	n.	27	15	2	13	5.0	17.1
New Haven.....	107	118	140	29.92	30.04	+.03	41.0	41.0	60	6	48	24	32	39	83	5.15	+.6	14	9,868	nw.	72	n.	27	15	2	13	5.0	17.1
Mid. Atl. States.																												
Albany.....	97	84	113	29.97	30.08	+.01	38.6	38.6	59	6	46	15	32	39	85	4.22	+.3	14	5,966	s.	36	s.	5	4	9	17	7.4	10.3
Binghamton.....	875	79	90	29.97	30.08	+.01	38.4	38.4	61	4	46	15	32	39	85	4.22	+.3	14	5,966	s.	36	s.	5	4	9	17	7.4	10.3
New York.....	314	313	346	29.72	30.07	-.01	44.6	44.6	63	2	51	23	37	44	84	5.90	+.2	12	12,580	nw.	65	nw.	11	9	9	12	6.0	14.0
Harrisburg.....	377	94	104	29.72	30.07	-.01	42.4	42.4	63	10	49	25	37	44	84	5.90	+.2	12	12,580	nw.	65	nw.	11	9	9	12	6.0	14.0
Philadelphia.....	117	168	184	29.97	30.10	+.01	44.6	44.6	63	5	51	26	37	44	84	5.90	+.2	12	12,580	nw.	65	nw.	11	9	9	12	6.0	14.0
Atlantic City.....	52	68	76	30.03	30.09	-.01	44.1	44.1	62	2	50	24	32	39	83	5.51	+.2	13	7,354	nw.	42	nw.	27	8	11	11	5.9	13.4
Cape May.....	24	52	70	30.09	30.11	-.01	44.2	44.2	63	10	52	24	32	39	83	5.51	+.2	13	7,354	nw.	42	nw.	27	8	11	11	5.9	13.4
Baltimore.....	123	68	82	29.98	30.11	-.01	44.6	44.6	63	10	52	24	32	39	83	5.51	+.2	13	7,354	nw.	42	nw.	27	8	11	11	5.9	13.4
Washington.....	112	59	76	30.01	30.14	+.01	44.0	44.0	63	10	52	24	32	39	83	5.51	+.2	13	7,354	nw.	42	nw.	27	8	11	11	5.9	13.4
Cape Henry.....	5	34	51	30.01	30.14	+.01	44.0	44.0	63	10	52	24	32	39	83	5.51	+.2	13	7,354	nw.	42	nw.	27	8	11	11	5.9	13.4
Lynchburg.....	683	83	88	29.41	30.17	+.03	45.0	45.0	63	10	52	24	32	39	83	5.51	+.2	13	7,354	nw.	42	nw.	27	8	11	11	5.9	13.4
Norfolk.....	57	88	93	30.09	30.16	+.04	49.9	49.9	71	9	54	24	37	43	86	2.61	-.03	11	3,275	nw.	30	nw.	27	12	9	5	3.1	3.0
Richmond.....	144	98	105	30.09	30.16	+.04	49.9	49.9	71	9	54	24	37	43	86	2.61	-.03	11	3,275	nw.	30	nw.	27	12	9	5	3.1	3.0
S. Atlantic States.																												
Charlotte.....	773	68	76	29.33	30.17	+.03	47.6	47.6	73	9	56	22	37	43	87	2.42	+.6	10	4,869	n.	36	nw.	26	13	6	11	4.9	4.9
Hatteras.....	11	17	36	30.14	30.15	+.04	54.7	54.7	74	10	60	31	37	49	92	4.08	+.1	12	11,122	n.	56	nw.	26	12	7	11	5.1	5.1
Kittyhawk.....	9	12	30	30.14	30.15	+.04	54.7	54.7	74	10	60	31	37	49	92	4.08	+.1	12	11,122	n.	56	nw.	26	12	7	11	5.1	5.1
Raleigh.....	375	93	101	29.77	30.18	+.01	48.9	48.9	75	7	58	24	37	40	89	4.63	+.6	12	10,640	n.	56	nw.	26	12	7	11	5.1	5.1
Wilmington.....	78	82	90	30.09	30.18	+.05	53.8	53.8	76	5	62	27	37	45	89	2.73	+.6	14	4,391	n.	32	nw.	27	13	3	14	5.0	0.3
Charleston.....	48	14	92	30.13	30.18	+.05	56.9	56.9	77	10	64	30	37	50	90	2.67	+.2	10	6,113	n.	33	nw.	19	14	7	9	4.7	4.7
Columbia.....	5	5	5	30.13	30.18	+.05	56.9	56.9	77	10	64	30	37	50	90	2.67	+.2	10	6,113	n.	33	nw.	19	14	7	9	4.7	4.7
Augusta.....	180	89	109	29.98	30.17	+.04	51.0	51.0	77	9	61	24	37	40	89	4.63	+.6	12	8,252	n.	32	nw.	26	12	7	11	4.9	4.9
Savannah.....	82	63	80	30.08	30.17	+.02	52.2	52.2	77	9	61	24	37	40	89	4.63	+.6	12	8,252	n.	32	nw.	26	12	7	11	4.9	4.9
Jacksonville.....	43	69	84	30.09	30.14	+.02	57.6	57.6	79	10	65	31	37	49	94	5.10	+.2	11	4,487	n.	29	nw.	29	12	7	11	4.9	4.9
Florida Peninsula.																												
Jupiter.....	28	13	30	30.06	30.09	-.01	72.9	72.9	82	29	78	56	30	68	18	1.77	-.03	8	8,640	e.	32	ne.	1	13	13	4	4.5	4.5
Key West.....	22	43	50	30.05	30.07	+.01	75.6	75.6	84	11	79	47	1	72	11	1.11	-.23	8	8,640	e.	32	ne.	1	13	13	4	4.5	4.5
Tampa.....	36	60	67	30.06	30.10	-.01	67.9	67.9	84	5	76	47	1	72	11	1.11	-.23	8	8,640	e.	32	ne.	1	13	13	4	4.5	4.5
East Gulf States.																												
Atlanta.....	1,131	92	126	29.97	30.19	+.02	54.4	48.6	73	5	57	18	37	40	89	4.63	+.6	12	10,640	n.	56	nw.	26	12	7	11	4.9	4.9
Pensacola.....	56	78	90	30.09	30.15	+.02	57.7	57.7	75	3	66	32	33	50	83	3.36	+.2	11	6,933	nw.	32	nw.	26	12	7	11	4.8	4.8
Mobile.....	57	88	96	30.10	30.16	+.02	55.6	55.6	75	3	66	32	33	50	83	3.36	+.2	11	6,933	nw.	32	nw.	26	12	7	11	4.8	4.8
Montgomery.....	221	100	112	29.92	30.16	-.01	53.1	53.1	78	5	62	27	37	44	82	2.74	+.6	14	5,737	n.	28	n.	6	15	9	6	4.0	4.0
Vicksburg.....	247	65	73	29.87	30.15	-.01	52.2	52.2	78	5	62	27	37	44	82	2.74	+.6	14	5,737	n.	28	n.	6	15	9	6	4.0	4.0
New Orleans.....	54	112	120	30.09	30.15	+.03	57.4	57.4	81	4	61	26	37	43	86	2.90	-.02	14	5,408	n.	28	s.	20	8	13	9	5.7	5.7
Port Eads.....	37	37	37	30.09	30.15	+.03	57.4	57.4	81	4	61	26	37	43	86	2.90	-.02	14	5,408	n.	28	s.	20	8	13	9	5.7	5.7
West Gulf States.																												
Shreveport.....	249	77	84	29.86	30.13	-.01	53.8	53.8	82	5	62	27	37	44	82	2.73	+.6	14	4,391	n.	32	nw.	27	13	3	14	5.0	0.3
Port Smith.....	481	63	72	29.58	30.10	-.02	48.0	48.0	82	5	62	27	37	44	82	2.73	+.6	14	4,391	n.	32	nw.	27	13	3	14	5.0	0.3
Little Rock.....	357	98	100	29.76	30.16	+.02	48.2	48.2	82	5	62	27	37	44	82	2.73	+.6	14	4,391	n.	32	nw.	27	13	3	14	5.0	0.3
Corpus Christi.....	30	42	50	30.09	30.11	-.01	60.2	60.2	85	19	62	32	40	43	89	4.63	+.6	12	8,252	n.	32	nw.	26	12	7	11	4.9	4.9
Port Worth.....	670	106	114	29.92	30.11	-.01	51.0	51.0	85	19	62	32	40	43	89	4.63	+.6	12	8,252	n.	32	nw.	26	12	7	11	4.9	4.9
Galveston.....	54	85	96	30.05	30.10	-.02	58.2																					

TABLE I.—Climatological data for Weather Bureau Stations, November, 1898—Continued.

Stations.	Elevation of instruments		Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.										Precipitation, in inches.			Wind.												
	Barometer above sea level, feet.	Thermometers above ground.	Anemometer above ground.	Mean actual, 8 a. m. and 8 p. m. + 2.	Mean reduced.	Departure from normal.	Mean max. and min. + 2.	Departure from normal.	Maximum.	Date.	Mean minimum.	Date.	Mean minimum.	Greatest daily range.	Mean wet thermometer.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Total.	Departure from normal.	Days with .01 or more.	Total movement, miles.	Prevailing direction.	Miles per hour.	Direction.	Date.	Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Total snowfall.	
Up. Miss. Val.—Con.																															
Davenport.....	599	71	79	29.37	30.04	-.05	34.6	-.2.2	68	4	43	-1	26	26	35	31	27	79	1.37	-.0.7	12	6,430	sw.	37	nw.	5	11	8	11	5.3	6.5
Des Moines.....	867	84	88	29.11	30.08	-.02	34.1	-.2.3	69	30	44	-1	26	26	35	30	24	71	1.87	+.0.2	10	6,194	nw.	37	sw.	4	16	8	6	4.2	12.3
Dubuque.....	698	101	109	29.25	30.04	-.04	33.8	-.1.2	67	4	42	-1	26	25	34	30	25	74	1.15	-.1.0	9	6,158	se.	42	nw.	5	11	9	10	5.0	2.9
Keokuk.....	614	64	78	29.40	30.08	-.01	38.4	-.0.4	72	7	47	0	26	30	32	33	28	72	1.52	-.0.6	10	6,710	sw.	36	nw.	5	12	12	6	4.2	2.5
Cairo.....	359	87	93	29.74	30.13	+.02	45.2	-.1.0	75	5	54	15	27	37	40	40	35	74	1.55	-.2.7	9	6,873	s.	42	nw.	21	8	13	9	5.4	T.
Springfield, Ill.....	644	82	92	29.38	30.09	-.02	38.2	-.2.7	69	4	45	2	26	31	26	33	28	72	2.94	0.0	9	7,806	s.	36	s.	21	11	10	9	5.1	0.6
Hannibal.....	534	75	107	29.38	30.09	-.02	39.5	-.0.7	73	4	48	4	26	31	47	38	31	47	2.58	+.0.4	10	7,568	sw.	44	s.	7	20	2	8	3.8	1.2
St. Louis.....	567	111	210	29.49	30.12	-.00	43.1	-.0.5	74	3	51	10	26	35	45	37	32	68	2.07	-.1.0	8	8,040	sw.	58	sw.	21	11	10	9	4.8	0.5
Missouri Valley.																															
Columbia.....	4	84		29.04	30.11	-.01	40.2	-.2.2	76	30	51	6	26	29	54	35	29	54	2.29	-.0.6	10	7,080	s.	35	nw.	5	12	10	8	5.2	0.9
Kansas City.....	963	78	95	29.04	30.11	-.01	40.3	-.0.4	73	3	49	6	23	32	56	33	26	65	2.72	+.0.5	9	6,483	se.	39	se.	20	14	9	7	4.2	7.4
Springfield, Mo.....	1,324	100	103	28.66	30.11	-.00	41.8	-.1.7	72	20	50	6	23	33	44	36	29	65	2.86	-.1.2	6	8,782	sw.	43	w.	21	10	11	9	5.2	0.8
Topeka.....	81			29.04	30.11	-.01	39.4	-.1.8	76	7	49	4	23	29	54	35	29	65	1.13	-.0.2	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lincoln.....	1,199	74	84	28.74	30.07	-.06	34.3	-.3.8	76	3	45	-2	23	22	46	29	22	68	0.95	+.0.2	6	8,887	s.	48	nw.	22	14	8	8	4.4	7.7
Omaha.....	1,103	92	97	28.84	30.06	-.06	35.1	-.1.5	76	3	45	-1	22	26	46	29	23	68	1.20	+.0.1	6	6,168	nw.	34	nw.	21	13	10	7	4.6	11.9
Sioux City.....	1,139	96	164	28.31	30.06	-.05	32.1	-.2.2	67	3	41	-4	23	23	34	24	10	262	0.45	-.0.3	6	10,262	nw.	60	nw.	22	14	6	10	4.8	8.0
Pierre.....	1,572	50	62	28.31	30.06	-.05	29.3	-.2.7	71	3	41	-10	22	18	43	22	12	55	0.17	-.0.3	3	7,967	nw.	59	nw.	21	13	12	5	4.1	1.7
Huron.....	1,306	56	67	28.58	30.06	-.05	26.8	-.2.7	68	3	39	-11	23	14	46	21	16	70	0.23	-.0.4	4	9,318	nw.	45	nw.	21	10	16	4	4.7	2.0
Yankton.....	1,234	52	58	28.58	30.06	-.05	31.8	-.1.0	68	3	43	-6	22	21	37	21	16	70	0.25	-.0.4	2	7,429	nw.	46	nw.	21	8	15	7	5.5	2.5
Northern Slope.																															
Havre.....	2,494	46	47	27.24	29.97	-.12	28.3	-.1.6	59	6	37	-7	20	19	44	24	20	76	0.24	+.0.4	7	9,295	sw.	52	nw.	6	8	16	6	5.3	2.4
Miles City.....	2,372	41	49	27.42	29.97	-.10	28.4	-.2.9	60	3	38	-12	22	19	32	24	20	77	0.92	+.0.5	7	4,626	sw.	36	w.	5	13	13	4	4.1	7.3
Helena.....	4,108	88	93	25.79	30.13	-.01	29.1	-.0.4	51	6	36	-10	21	22	40	24	16	60	0.66	0.0	10	5,721	sw.	45	sw.	3	3	10	17	6.9	5.0
Rapid City.....	3,251	46	50	26.55	30.04	-.10	31.3	-.3.6	68	19	43	-7	22	20	42	24	16	64	0.06	-.0.3	2	5,644	nw.	36	nw.	21	11	13	6	4.8	0.6
Cheyenne.....	6,084	58	60	23.91	30.18	+.03	28.6	-.5.6	66	19	41	-8	9	16	49	22	12	56	1.58	+.1.2	7	8,301	nw.	54	nw.	4	14	12	4	4.1	15.8
Lander.....	5,372	28	36	24.58	30.13	-.07	30.0	+.0.4	64	6	44	-8	21	16	47	22	13	60	0.25	-.0.5	4	3,195	sw.	42	w.	6	13	14	3	4.6	2.5
North Platte.....	2,826	43	52	27.04	30.11	-.04	31.4	-.3.8	68	3	45	-6	22	18	46	25	18	66	0.51	+.0.2	7	6,637	nw.	45	n.	21	13	12	5	4.4	6.5
Middle Slope.																															
Denver.....	5,290	79	151	24.66	30.14	-.04	35.2	-.2.8	74	19	48	2	21	22	57	27	15	51	0.85	+.0.2	7	5,908	s.	50	nw.	28	17	10	3	3.6	9.0
Pueblo.....	4,682	74	81	25.25	30.09	-.04	36.8	-.2.0	74	19	52	4	22	22	49	29	17	54	0.43	+.0.1	4	5,268	w.	52	n.	20	13	11	6	4.6	2.6
Concordia.....	1,398	42	47	28.54	30.08	-.06	37.0	-.3.0	77	3	47	-5	23	27	44	30	23	67	1.09	+.0.2	4	5,730	s.	30	s.	4	13	11	6	4.3	10.9
Dodge.....	2,504	44	52	27.39	30.09	-.02	38.8	-.1.4	78	7	51	5	22	26	56	30	24	66	0.96	+.0.5	4	8,630	nw.	48	nw.	21	18	8	4	3.4	7.5
Wichita.....	1,351	78	85	28.61	30.09	-.04	41.0	-.1.8	75	4	50	9	32	33	25	61	1	13	1.13	+.0.2	4	7,473	se.	36	s.	7	16	6	8	4.3	5.1
Oklahoma.....	1,218	54	62	28.78	30.11	-.01	46.0	-.3.3	82	19	58	14	21	34	50	38	33	67	0.91	-.1.0	3	8,468	se.	40	s.	7	15	9	6	3.5	0.2
Southern Slope.																															
Abilene.....	1,749	45	54	28.27	30.14	-.00	51.3	-.0.7	81	19	62	24	22	40	43	41	32	57	0.98	-.0.4	4	7,796	sw.	36	nw.	21	13	7	10	4.9	.....
Amarillo.....	3,691	54	61	26.25	30.11	-.02	42.0	-.2.5	80	7	55	13	22	30	44	34	26	63	0.34	0.0	3	12,928	s.	68	n.	21	30	8	2	2.6	2.5
Southern Plateau.																															
El Paso.....	3,767	10	110	26.19	30.06	-.05	52.2	+.0.7	81	7	66	20	22	38	42	38	21	38	0.16	-.0.3	1	8,595	nw.	64	sw.	30	20	8	2	1.2	.....
Santa Fe.....	6,998	47	50	23.22	30.09	-.04	37.0	-.0.6	62	7	47	12	27	30	28	14	45	0.27	-.0.5	4	4,768	se.	41	sw.	30	25	2	8	2.1	2.6	
Flag-staff.....	6,885	12	25	23.35	30.19	-.08	34.8	-.0.8	68	6	52	3	9	18	50	27	.....	0.26	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Phoenix.....	1,076	47	57	28.83	29.98	-.07	57.4	-.0.5	90	6	73	30	23	42	43	25	35	1.01	+.0.6	3	2,640	e.	36	w.	30	24	4	2	0.9	.....
Yuma.....	139	16	50	29.80	29.95	-.07	60.4	-.1.5	91	6	75	34	24	46	41	46	29	36	0.21	-.0.1	1	4,768	n.	36	w.	20	27	3	0	0.9	.....
Independence.....	3,907	10	58	26.03	30.04	-.06	48.2	+.0.4	81	4	61	24	21	36	33	35	13	28	0.10	-.0.1	3	6,164	nw.	36	nw.	7	24	5	1	1.4	.....
Middle Plateau.																															
Carson City																															

TABLE II.—Meteorological record of voluntary and other cooperating observers, November, 1898.

Stations.	Temperature. (Fahrenheit.)			Precipitation.		Stations.	Temperature. (Fahrenheit.)			Precipitation.		Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.		Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.		Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
Alabama.						Arizona—Cont'd.						California—Cont'd.					
Alecot.....	79	27	53.5	8.26		Tuba	81	19	45.4	0.06		East Brother L. H.....	71	21	40.6	4.10	11.0
Ashville.....	74	17	48.4	4.25		Tucson.....	90	21	54.5	0.85		Edmonton*.....	71	21	40.6	4.10	
Bermuda.....	78	25	54.5	9.33		Walnut Grove.....	78	30	52.7	0.06		Elsinore.....	94	28	59.1	0.04	
Birmingham.....	78	21	51.2	5.28		White Hills.....	78	30	52.7	0.02		Escondido.....	89	24	52.2	0.11	
Bridgeport.....	79	30	55.2	3.52		Willcox.....	71	7	36.7	0.08		Fallbrook*.....	97	39	55.2	0.02	
Citronelle.....	73	24	50.1	8.22		Williams.....	70	14	41.2	0.60	6.0	Folsom City*.....	78	34	52.8	1.54	
Clanton.....	73	15	47.4	3.37		Winslow.....	70	14	41.2	T.		Forty Dam.....	78	34	52.8	1.54	24.0
Decatur.....	79	27	53.5	5.38		Yarnell.....	70	14	41.2	0.70	T.	Fort Bragg.....	78	34	52.8	1.54	
Demopolis.....	79	27	53.5	9.68		Arkansas.						Fort Romie.....	91	22	51.6	0.19	
Elba.....	79	26	52.9	7.52		Amity.....	80	20	48.4	4.40		Fort Ross.....	76	37	52.4	2.74	
Eufaula.....	79	26	52.9	7.52		Arkansas City.....	80	20	48.4	3.65		Fort Tejon.....	76	37	52.4	2.74	
Eufaula.....	79	26	52.9	7.52		Beebranch.....	89	12	46.8	2.20		Georgetown.....	77	30	50.0	4.34	T.
Evergreen.....	79	26	52.9	9.00		Blanchard Springs.....	78	20	49.2	6.19		Glendora.....	77	30	50.0	4.34	
Florence.....	73	19	48.3	3.50		Brinkley.....	76	20	50.4	3.35		Goshen.....	76	29	51.8	0.15	
Florence.....	73	19	48.3	3.50		Camden.....	80	22	49.2	4.70		Grand Island.....	82	29	55.4	0.50	
Fort Deposit.....	74	18	47.0	8.86		Camden.....	80	22	49.2	4.77		Grass Valley.....	76	13	39.4	2.15	1.0
Gadsden.....	74	18	47.0	8.86		Canton.....	74	19	44.7	2.36	T.	Greenville.....	81	25	55.6	1.06	
Goodwater.....	77	25	50.8	5.32		Conway.....	82	19	49.1	2.36	T.	Healdsburg.....	76	29	51.8	0.15	
Greensboro.....	78	25	50.8	5.32		Corning.....	78	16	45.0	2.21	T.	Hollister.....	86	23	52.4	0.36	
Hamilton.....	76	30	46.9	3.52		Dallas.....	75	17	46.1	2.89	T.	Hueneme (near).....	87	40	59.3	T.	
Healing Springs.....	80	27	53.7	7.02		Dardanelle.....	80	23	50.1	1.98		Humboldt L. H.....	77	30	46.4	0.40	
Highland Home.....	82	27	53.7	7.02		Elton.....	77	11	45.7	2.57	T.	Indio.....	92	33	59.2	0.00	
Jasper.....	80	27	50.4	5.99		Fayetteville.....	77	11	45.7	2.57	T.	Iowa Hill.....	76	34	50.2	4.03	
Livingston.....	80	27	50.4	5.99		Fulton.....	77	15	45.0	3.94		Jackson.....	76	30	50.3	2.11	
Look No. 4.....	73	21	47.8	4.84		Hardy.....	77	15	45.0	2.65		Jolon.....	77	30	49.8	0.24	
Madison Station.....	72	18	46.6	3.66		Helena.....	80	21	51.8	3.15		Keene.....	77	30	46.4	0.40	
Maple Grove.....	74	18	46.6	3.66		Helena.....	80	21	51.8	3.15		Kennedy Gold Mine.....	77	30	49.8	2.99	
Marion.....	77	28	54.8	3.16		Hot Springs.....	77	18	46.4	2.88		Kernville.....	77	30	49.8	2.99	
Mount Willing.....	85	22	54.3	8.77		Jonesboro.....	74	18	46.4	1.59		King City.....	78	28	45.8	0.22	
Newbern.....	80	25	51.1	6.02		Keesee Ferry.....	74	14	45.2	2.69	T.	Kingsburg.....	78	30	52.7	0.20	
Newton.....	80	25	52.0	7.17		Laconia.....	77	15	44.2	1.50		Kono Tayee.....	70	38	51.6	1.15	
Oneonta.....	78	12	47.6	4.03		Lacrosse.....	75	23	47.8	3.93		Lagrange.....	82	32	54.4	0.86	
Opelika.....	78	20	50.7	7.26		Lonoke.....	80	25	50.1	5.47		Laporte.....	67	18	38.1	6.67	15.5
Oxanna.....	74	16	48.6	4.32		Luna Landing.....	81	20	49.3	4.11		Las Fuentes Ranch.....	78	26	47.3	0.22	
Pineapple.....	80	28	53.7	6.55		Lutherville.....	82	20	48.0	4.11		Lemoore.....	78	26	47.3	0.22	
Pushmataha.....	75	27	50.3	6.98		Malvern.....	78	24	50.2	3.18		Lick Observatory.....	75	28	46.5	1.23	0.1
Riverton.....	76	17	46.3	3.42		Marianna.....	78	24	50.2	3.18		Limekiln.....	82	33	54.4	0.76	
Rockmill.....	75	20	50.8	6.49		Marvell.....	78	22	49.8	3.18		Lime Point L. H.....	78	33	53.1	0.66	
Scottsboro.....	71	17	45.4	4.42		Mossville.....	69	9	42.0	2.60		Lodi.....	78	33	53.1	0.66	
Seima.....	79	26	50.6	5.72		Mount Nebo.....	73	12	45.4	2.19		Los Alamos.....	78	36	52.8	0.46	
Talladega.....	81	21	50.4	5.95		New Gascony.....	73	22	48.2	3.20	T.	Los Gatos.....	78	29	48.4	5.66	
Tallassee.....	80	26	55.0	7.12		Newport.....	76	17	45.2	2.33		Mammoth Tank.....	92	44	60.0	T.	
Thomasville.....	80	26	55.0	7.12		Newport.....	76	17	45.2	2.33		Manzana.....	82	29	51.2	T.	
Tuscaloosa.....	78	24	49.4	4.39		Newport.....	76	17	45.2	2.33		Mare Island L. H.....	84	30	53.0	0.20	
Union.....	82	24	52.0	4.70		Newport.....	76	17	45.2	2.33		Merced.....	84	30	53.0	0.20	
Union Springs.....	82	24	52.0	4.70		Oregon.....	70	12	42.2	2.22	T.	Mills College.....	84	30	53.0	0.20	
Uniontown.....	79	27	52.1	5.73		Osceola.....	78	17	45.8	3.61		Milo.....	78	31	53.4	1.30	
Valleyhead.....	71	18	46.0	1.61		Ozark.....	76	18	48.9	2.18	T.	Modesto.....	82	34	56.4	0.38	
Warrior.....	78	26	51.2	5.81		Picayune.....	84	19	49.5	3.57		Mohave.....	84	32	53.3	0.00	
Wetumpka.....	78	26	51.2	6.71		Pinebluff.....	79	20	49.7	3.96		Mokelumne Hill.....	73	34	53.6	0.79	
Wilsonville.....	78	26	51.2	6.71		Pocahontas.....	72	19	44.8	2.30		Monterey.....	73	34	53.6	0.79	
Arizona.						Pond.....	74	10	43.6	2.55	T.	Mountain View.....	78	31	53.4	1.30	
Benson.....	71	33	54.9	T.	Powell.....	80	15	44.1	2.20		Mutah Plat.....	78	31	53.4	1.30		
Blisbee.....	73	29	52.0	1.01	Prescott.....	82	21	50.8	3.74		Napa.....	88	32	54.4	0.65		
Buckeye.....	92	27	55.2	0.30	Rison.....	87	21	50.2	3.77		Needles.....	85	36	57.0	0.00		
Calabasas.....	82	14	48.9	0.60	Russellville.....	74	18	46.3	2.65	T.	Nevada City.....	75	27	45.6	3.49		
Camp Creek.....	84	34	57.8	1.10	Silver Springs.....	78	11	44.6	2.19	0.1	Newhall.....	92	30	53.7	0.00		
Casa Grande.....	88	39	61.0	0.05	Spielerville.....	80	18	47.0	2.29		North Ontario.....	90	38	58.0	0.12		
Champer Camp.....	94	30	58.3	1.30	Stamps.....	87	20	48.5	3.97		North San Juan.....	72	27	45.5	4.56		
Congress.....	86	22	58.4	0.59	Stuttgart.....	79	21	47.8	3.25		Oakland.....	80	40	53.2	0.60		
Dragon Summit.....	82	35	55.4	0.49	Texarkana.....	84	22	51.8	3.13		Ogby.....	95	45	67.6	0.00		
Dudleyville.....	84	34	53.4	0.45	Warren.....	79	21	51.7	4.22		Oleta.....	76	30	46.6	2.34		
Empire Ranch.....	79	20	50.6	0.73	Washington.....	80	24	49.9	4.35		Orland.....	86	30	53.5	0.34		
Fort Apache.....	77	20	44.4	0.57	Wiggs.....	80	18	50.7	3.79		Palermo.....	81	31	52.5	1.16		
Fort Defiance.....	65	6	33.8	1.10	Winslow.....	68	9	41.7	3.11	2.0	Paso Robles.....	81	22	50.0	0.30		
Fort Grant.....	80	28	52.8	0.50	Witts Springs.....	73	10	44.6	2.81		Peachland.....	82	30	53.0	1.25		
Fort Huachuca.....	80	21	52.3	1.30	California.						Piedras Blancas L. H.....	78	31	53.4	1.30		
Fort Mohave.....	94	32	58.7	T.	Agnew.....	80	28	51.1	0.41		Pigeon Point L. H.....	78	31	53.4	1.30		
Gilabend.....	89	36	59.6	T.	Anada.....	77	22	45.8	4.10		Pilot Creek.....	91	43	62.4	0.70	10.0	
Holbrook.....	74	10	40.2	0.13	Arlington Heights.....	93	36	59.0	0.01		Placerville.....	81	28	49.8	2.30		
Hot Springs.....	86	38	58.6	0.75	Ballast Point L. H.....	78	41	53.7	0.97	13.0	Point Ano Nuevo L. H.....	78	31	53.4	1.30		
Jerome.....	77	27	49.0	0.70	Bear Valley.....	85	17	45.8	0.21		Point Arena L. H.....	78	31	53.4	1.30		
Lochiel.....	78																

TABLE II.—Meteorological record of voluntary and other cooperating observers—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.		Stations.	Temperature. (Fahrenheit.)			Precipitation.		Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.		Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.		Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
<i>California—Cont'd.</i>						<i>Colorado—Cont'd.</i>						<i>Florida—Cont'd.</i>					
Salinas*1.	77	31	51.8	0.31		Meeker.	62	-16	28.2	1.57	16.0	Sebastian.	83	50	70.6	1.55	
Salton*1.	95	40	59.1	0.00		Millbrook.	61	-3	30.8	0.60	7.5	Stephensville.	79	39	61.9	2.70	
San Bernardino*1.	92	30	56.2	0.05		Minneapolis*1.	85	-3	38.0	0.38	2.0	Switzerland*1.	83	31	58.2	3.52	
San Jacinto.	91	26	54.4	0.18		Moraine*1.	59	-12	28.1	1.77	25.5	Tallahassee*1.	87	43	68.4	1.07	
San Leandro*1.	92	41	57.1	0.06		Pagoda*1.	66	-17	28.6	2.05	30.5	Tarpon Springs*1.	81	30	54.5	6.21	
San Luis L. H.	80	37	54.3	0.55		Parachute.	70	10	37.2	0.70		Wausau*1.	72	19	46.4	3.21	
San Mateo*1.	86	22	50.8	0.19		Rangely.	65	0	26.1			Adairsville.	78	27	53.7	6.37	
San Miguel*1.	88	42	59.1	0.00		Redcliff.	59	-6	27.3	0.85	10.0	Allentown*1.	86	20	53.5	6.44	
Santa Barbara.	89	29	59.0	0.36		Rico.	80	2	34.4	0.37	0.2	Americus*1.	75	21	48.2	3.85	
Santa Clara.	89	29	59.0	0.86		Rockyford.	68	-1	34.6	0.48	4.5	Bellville.	79	30	55.4	7.90	
Santa Cruz*1.	91	31	57.0	0.05		Saguache*1.	63	-11	37.2	1.17	11.7	Blakely*1.	73	30	47.8	4.12	
Santa Maria.	76	39	60.4	0.00		Salida.	60	-2	32.6	0.82	11.0	Cartersville.	74	23	46.0	3.83	
Santa Monica*1.	89	32	56.6	0.00		San Luis*1.	55	-1	29.4	0.24	2.5	Cedartown*1.	68	19	46.2	5.41	
Santa Paula.	78	27	53.4	1.16		Seguro.	71	-6	32.2	2.17	28.5	Clayton*1.	84	26	54.8	5.75	
Santa Rosa*1.	88	42	60.1	0.00		Selbert*1.	58	-17	25.4	0.50	2.5	Columbus.	75	30	47.8	4.04	
Saticoy.	88	42	60.1	0.00		Smoky Hill Mine.	58	-17	25.4	1.80	27.0	Crescent.	72	16	46.4	4.45	
Shasta.	88	42	60.1	0.00		Springfield.	58	-17	25.4	1.80	27.0	Dahlonega*1.	72	16	46.4	4.45	
Sierra Madre.	88	42	60.1	0.00		Stamford*1.	58	-17	25.4	1.80	27.0	Diamond.	68	11	44.4	4.52	
Sneddens Ranch.	88	42	60.1	0.00		Steamboat Springs.	58	-17	25.4	1.80	27.0	Dublin.	74	29	49.8	4.78	
Sonoma.	88	42	60.1	0.00		Strickler Tunnel.	58	-17	25.4	1.80	27.0	Elberton.	80	28	55.0	6.32	
Stanford University.	88	42	60.1	0.00		Trinidad.	58	-17	25.4	1.80	27.0	Fitzgerald.	82	28	56.4	5.37	
Stockton.	88	42	60.1	0.00		T. S. Ranch*1.	58	-17	25.4	1.80	27.0	Fleming*1.	79	36	54.2	7.77	
Summerdale*1.	88	42	60.1	0.00		Vilas.	58	-17	25.4	1.80	27.0	Fort Gaines.	73	29	50.4	4.92	
Susana*1.	88	42	60.1	0.00		Wagon Wheel.	58	-17	25.4	1.80	27.0	Franklin.	70	20	46.4	3.58	
Sutter Creek*1.	88	42	60.1	0.00		Walnut.	58	-17	25.4	1.80	27.0	Gainesville.	75	19	49.0	3.57	
Tehama*1.	88	42	60.1	0.00		Wray*1.	58	-17	25.4	1.80	27.0	Gillsville*1.	71	17	45.4	4.02	
Tejon Ranch.	88	42	60.1	0.00		Yuma.	58	-17	25.4	1.80	27.0	Greenbush.	77	24	50.5	5.70	
Templeton*1.	88	42	60.1	0.00								Griffin.	78	26	52.6	4.84	
Thermalito.	88	42	60.1	0.00								Harrison.	89	32	53.9	4.48	
Trinidad L. H.	88	42	60.1	0.00								Hawkinsville.	74	27	57.4	6.43	
Truckee*1.	88	42	60.1	0.00								Hephzibah*1.	83	27	57.4	6.43	
Tulare*1.	88	42	60.1	0.00								Jesup.	76	10	50.0	4.31	
Turlock.	88	42	60.1	0.00								Lagrange*1.	79	26	53.2	5.15	
Ukiah.	88	42	60.1	0.00								Louisville.	72	18	46.4	3.25	
Upperlake.	88	42	60.1	0.00								Marionville*1.	77	24	53.5	6.70	
Upper Mattole*1.	88	42	60.1	0.00								Mauzy.	79	28	56.0	5.29	
Vacaville*1.	88	42	60.1	0.00								Millen*1.	82	25	53.2	3.21	
Ventura*1.	88	42	60.1	0.00								Morgan.	83	25	54.4	7.24	
Via*1.	88	42	60.1	0.00								Newman.	74	20	45.4	4.50	
Volcano Springs*1.	88	42	60.1	0.00								Piscola.	72	13	45.2	4.58	
Walnut Creek.	88	42	60.1	0.00								Point Peter.	81	26	54.6	6.43	
West Palmdale.	88	42	60.1	0.00								Quitman*1.	79	39	57.1	3.35	
Westpoint.	88	42	60.1	0.00								Ramsey.	75	17	49.2	3.82	
Wheatland.	88	42	60.1	0.00								Resaca.	75	17	49.2	3.82	
Williams*1.	88	42	60.1	0.00								Reynolds.	72	25	46.9	3.31	
Wilmington.	88	42	60.1	0.00								Rome*1.	73	24	51.4	5.87	
Wire Bridge*1.	88	42	60.1	0.00								Talbotton*1.	73	18	46.8	4.34	
Yerba Buena L. H.	88	42	60.1	0.00								Tallapoosa.	82	30	56.8	4.80	
Yreka*1.	88	42	60.1	0.00								Thomasville*1.	72	22	46.9	3.26	
Yuba City.	88	42	60.1	0.00								Toccoa*1.	72	22	46.9	3.26	
<i>Colorado.</i>						<i>Delaware.</i>						<i>Idaho.</i>					
Altman.	52	-9	22.3	0.96	15.0	Dover.	67	22	43.4	4.53		American Falls.	60	2	34.6		
Antlers*1.	66	1	31.2	0.79	5.5	Millboro.	72	23	46.2	4.22	7.0	Atlanta.	52	1	29.8	4.92	73.2
Arkins.	72	6	36.6	1.76	23.5	Millsboro.	73	24	44.8	4.81		Blackfoot*1.	61	-8	27.5	0.30	2.0
Boulder.	72	6	36.6	1.76	23.5	Newark.	65	22	41.6	5.57	4.0	Boise Barracks.	59	17	35.6	2.11	0.1
Boxelder.	58	-30	19.6	4.09	59.2	Seaford.	70	25	45.0	3.77	4.0	Burnside*1.	53	-5	25.0	1.28	12.5
Breckenridge*1.	58	-30	19.6	4.09	59.2							Downey.	60	0	28.0	0.65	6.5
Canyon*1.	77	7	40.8	0.15	1.3							Fort Sherman*1.	55	18	34.6	4.52	7.5
Cedaredge.	73	-8	32.1	1.00	10.5							Gimlet.	45	-2	23.7	1.66	12.0
Cheyenne Wells.	76	-12	33.4	0.45	2.2							Kootenai.	50	7	29.6	3.35	16.0
Colbran.	72	2	34.2	0.18	2.3							Lake.	40	-10	15.8	0.80	8.0
Colorado Springs*1.	72	2	34.2	0.18	2.3							Lakeview.	53	21	35.6	2.48	
Cope.	73	5	34.2	0.18	2.3							Lewiston.	58	24	43.4	1.28	1.0
Crook.	71	-1	33.3	0.35	3.5							Lost River.	56	-1	25.4	0.33	3.2
Delta.	70	8	35.6	0.18	1.8							Minidoka.	70	0	33.1	0.90	8.0
Dumont*1.	69	7	35.0	0.88	6.5							Moscow.	50	19	31.9	3.36	22.8
Durango.	65	-14	28.8	0.85	11.0							Murray*1.	49	5	32.0		
Fairview.	71	-11	30.3	1.24	11.5							Oakley.	66	12	34.6	1.40	5.0
Fort Collins*1.	72	-3	28.2	0.40	5.0							Ola.	57	-3	33.2	3.71	18.8
Fort Morgan.	72	-3	28.2	0.40	5.0							Paris.	68	-1	29.6	1.32	13.5
Fox.	60	-14	21.0	0.50	5.5							Payette.	79	5	36.2	2.98	6.0
Garnett.	57	5	30.5	0.28	3.5							Pollock*1.	60	15	38.2	0.72	2.0
Georgetown.	68	3	33.6	0.28	3.5							St. Maries.	54	19	35.8	3.97	9.5
Glennville*1.	67	16	38.8	0.25	7.5							Salubria.	58	1	35.5	3.25	24.1
Grand Junction*1.	72	-2	29.7	0.60	13.2							Soldier*1.	61	-23	26.2	1.89	20.6
Greeley.	63	-11	26.2	1.06	13.2							Swan Valley*1.	66	0	34.0	1.68	10.0
Gunnison.	72	-3	30.8	0.28	2.8												
Hamp.	74	-4	36.4	0.74	8.0												
Hoehne.	72	-3	30.8	0.28	2.8												
Holly.	74	-4	36.4	0.74	8.0												
Holyoke.	72	-3	30.8	0.28	2.8												
Hugo.	74	-4	36.4	0.74	8.0												
Husted*1.	52	-9	22.3	0.96	15.0												
Lake Moraine.	83	4	39.8	0.46	3.2												
Lamar*1.	76	0	37.5	T.													
Laporte.	52	-2	24.5	2.26	34.8												
Las Animas*1.	75	1	34.5	0.65	5.5												
Leadville (near)*1.	57	-12	26.8	1.00	12.0												
Leroy*1.	62	-1	31.5	0.40	3.8												
Longs Peak*1.																	
Loveland.																	
Mancos.																	

TABLE II.—Meteorological record of voluntary and other cooperating observers—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.		Stations.	Temperature. (Fahrenheit.)			Precipitation.		Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.		Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.		Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
Illinois—Cont'd.						Indiana—Cont'd.						Iowa—Cont'd.					
Carlinville	72	4	40.2	2.63	2.0	Farmland	67	8	38.1	2.98	3.5	Hampton	65	10	30.1	2.52	14.1
Carlyle	68	2	36.6	1.84	0.6	Fort Wayne	68	5	36.4	3.56	4.5	Hawkeye	72	6	33.4	2.50	8.5
Carrollton	69	1	39.6	1.66	0.9	Franklin ¹	69	9	39.9	2.48	1.7	Hedrick ¹	69	5	33.5	1.25	8.0
Charleston	69	1	39.6	1.66	0.9	Greensburg	70	6	39.7	3.79	1.0	Hopeville	69	5	33.5	1.25	8.0
Chemung	65	4	32.6	2.09	9.5	Hammond ¹	67	1	33.9	1.74	5.0	Humboldt ¹	66	11	31.2	0.93	6.6
Chester	74	9	41.8	1.23	0.5	Hector	66	4	36.4	2.33	1.2	Independence ¹	66	9	31.0	1.53	7.2
Cisne	70	1	37.0	2.39	1.0	Huntington	62	7	35.8	3.48	3.5	Indianola ¹	69	5	36.9	3.61	13.0
Coatsburg	73	10	43.0	1.60	1.0	Jeffersonville	71	13	43.3	2.56	1.0	Iowa City ¹	70	6	34.4	1.10	7.5
Cobden	67	2	36.8	3.08	1.5	Knightstown	68	6	37.4	2.60	2.5	Iowa Falls ¹	65	11	29.3	2.32	19.5
Cordova	80	1	40.6	2.96	2.7	Kokomo	68	4	38.6	3.12	1.8	Keosauqua	77	1	36.4	1.41	4.0
Danville	70	0	38.9	1.19	2.0	Lafayette	69	0	37.2	3.37	1.6	Knoxville	69	5	36.6	2.28	12.5
Decatur	68	2	34.0	2.50	0.3	Laporte	65	7	35.2	2.65	12.1	Lamoni	69	4	33.7	1.54	5.8
Dixon	68	2	34.7	2.32	1.5	Logansport ¹	68	3	36.5	3.29	1.2	Lansing	66	5	34.0	1.93	5.0
Dwight	70	4	40.4	2.30	0.3	Madison	70	9	41.4	2.90	1.2	Larchwood	67	11	29.5	1.05	9.2
Effingham	73	14	43.1	1.10	1.5	Marengo	69	2	37.2	3.54	4.5	Leclaire	65	7	30.4	0.80	8.0
Elgin	66	0	34.5	2.22	3.7	Marion	68	7	37.2	2.80	3.0	Lemars	69	8	33.4	1.36	4.1
Equality	71	6	41.4	2.58	11.4	Mauiy ¹	69	4	38.6	3.29	2.8	Lenox	69	9	35.1	0.90	9.0
Flora	68	10	36.6	2.31	5.0	Michigan City ¹⁰	77	16	37.9	4.21	6.6	Maple Valley	68	5	35.7	1.67	10.8
Fort Sheridan	65	1	34.8	2.31	0.6	Mount Vernon	75	7	41.7	0.88	3.0	Maquoketa	67	8	32.4	0.84	3.0
Friendgrove	68	1	35.8	2.48	2.0	Northfield	67	1	37.4	2.89	2.0	Marshall	67	8	32.4	0.84	3.0
Galva	72	12	43.3	2.12	0.6	Paoli	69	5	40.6	2.35	2.0	Mason City	63	11	30.6	1.42	12.0
Glenwood ¹	68	5	39.3	2.36	0.6	Peru	70	3	40.2	3.77	3.0	Monticello	68	7	33.0	1.42	12.0
Grafton	72	12	43.3	2.12	0.6	Princeton ¹	69	12	42.2	1.95	2.0	Moar	71	2	35.0	0.84	3.0
Grayville	68	5	39.3	2.36	0.6	Richmond	67	7	38.2	2.89	0.5	Mount Pleasant	70	5	34.8	2.23	8.3
Greenville	71	2	39.4	3.66	2.0	Rockville	69	2	38.5	3.32	T.	Mount Vernon ¹	68	8	32.7	1.50	4.0
Griggsville	75	14	43.0	1.30	2.0	Scottsburg	71	10	41.4	2.01	T.	Mount Vernon ¹	68	8	32.7	1.50	4.0
Halliday	72	4	41.0	2.24	2.0	Seymour	70	6	39.5	2.71	3.0	New Hampton	62	10	30.8	2.08	9.5
Havana	69	3	36.8	2.46	0.5	Shelbyville	65	6	37.9	2.72	3.0	Newton	67	8	32.5	2.19	10.0
Henry	71	3	40.1	2.32	9.6	South Bend	68	7	37.0	3.61	14.5	North McGregor	62	10	30.8	2.48	7.0
Hillsboro	67	0	36.0	2.61	7.5	Syracuse	77	16	37.9	4.21	6.6	Northwood	62	10	30.8	2.48	7.0
Joliet	70	1	35.4	2.33	2.0	Terre Haute	70	5	40.0	2.18	1.0	Odebolt	67	7	31.2	2.16	19.5
Kankakee	69	0	35.0	2.67	8.0	Topeka	65	1	32.0	3.12	2.0	Ogden	68	13	32.3	1.27	11.4
Kishwaukee	69	0	35.0	2.67	8.0	Valparaiso	68	4	34.4	0.60	1.0	Olin	74	7	31.0	1.24	6.5
Knoxville	68	2	36.4	2.69	2.5	Vevay	71	12	41.5	3.35	1.0	Osage ¹	71	5	33.6	1.50	6.0
Lagrange	70	1	38.2	1.65	5.0	Vincennes	74	10	41.6	4.00	T.	Oskaloosa	70	5	33.8	1.50	7.5
Laharpe	65	6	32.7	1.07	7.0	Washington	76	8	42.8	2.16	T.	Ottumwa	72	4	35.0	1.53	5.0
Lanark	69	1	37.0	2.09	2.8	Winamac	67	0	36.8	4.13	1.3	Ovid	71	5	34.8	1.77	6.2
Lexington	69	1	37.0	2.09	2.8	Worthington	72	5	39.8	2.88	1.3	Pella	69	13	30.4	1.27	6.0
Leamington	72	10	42.9	1.26	2.0	Healdton	88	12	49.6	1.85	4.0	Pioneer	63	14	31.0	1.60	16.0
McLeansboro	71	4	39.8	2.29	0.5	Kemp	87	21	50.4	2.20	2.0	Plover	70	8	29.6	0.99	7.6
Martinsville	69	0	36.6	2.81	2.6	Lehigh	86	18	47.2	1.23	T.	Primghar	62	12	28.0	1.00	7.0
Martinton	72	10	41.1	2.43	1.0	South McAlester	82	10	47.7	0.84	T.	Ridgway	65	9	32.7	2.32	6.5
Mascoutah	68	5	40.2	2.02	8.5	Tulsa	75	11	44.2	2.22	T.	Rockwell City	66	10	30.0	1.25	9.5
Mattoon	69	4	35.6	1.53	5.4	Wagoner	75	11	44.2	2.22	T.	Ruthven	66	10	29.8	0.95	9.5
Minonk	67	10	37.7	3.09	1.0	Webbers Falls	75	11	44.2	2.22	T.	Sac City	66	10	30.4	1.03	9.4
Monmouth	68	1	38.8	2.54	1.8	Afton	69	5	33.3	2.24	7.0	St. Charles	70	5	35.2	1.39	6.5
Morgan Park	70	0	39.2	2.26	2.0	Albia	69	3	37.2	1.90	9.5	Sibley	72	12	28.0	0.56	4.4
Morrisonville	73	10	40.4	2.14	0.2	Algona ¹	62	17	29.0	1.23	10.8	Sidney	71	1	34.4	1.59	17.5
Mount Carmel	73	9	43.8	0.99	0.2	Alta	66	8	29.8	1.37	4.9	Spencer	65	11	28.1	1.24	6.8
Mount Pulaski	71	7	41.8	2.14	0.2	Amana	68	6	33.0	1.08	10.0	Spirit Lake	65	11	28.1	1.24	6.8
Mount Vernon	68	3	35.6	2.88	5.5	Ames (near)	68	9	31.0	1.04	10.5	Storm Lake	64	17	29.0	0.86	5.5
New Burnside	70	7	37.6	3.15	0.8	Atlantic	67	7	30.6	1.01	9.0	Stuart	65	5	30.8	0.99	5.5
Olney	68	3	35.6	2.88	5.5	Audubon	67	7	30.6	1.01	9.0	Tara	69	0	30.2	2.00	5.8
Oswego ¹	70	4	38.6	2.48	1.0	Bedford	75	9	34.8	1.19	12.0	Thurman	67	11	34.2	1.14	9.8
Ottawa	68	3	35.6	2.88	5.5	Belknap	71	1	35.4	1.80	12.5	Toledo	67	8	32.0	1.99	9.0
Palestine	70	7	37.6	3.15	0.8	Belleplaine	68	10	32.4	2.15	4.5	Villisca	71	11	31.4	1.65	9.0
Pana	70	4	38.6	2.48	1.0	Bonaparte	70	2	35.5	1.21	6.5	Vinton	65	6	31.8	1.64	9.5
Paris	68	3	36.9	2.30	4.2	Britt	65	9	28.6	0.76	11.8	Wapello	70	2	38.2	1.05	7.0
Peoria	70	1	38.3	2.03	2.0	Burlington	70	2	35.8	0.76	11.8	Washington	70	2	38.2	1.05	7.0
Peoria ¹	69	0	37.3	3.20	1.2	Carroll	69	12	30.6	1.21	11.8	Washta	66	7	31.9	1.97	9.0
Philo	72	10	42.8	2.29	1.6	Cedar Falls	65	8	31.4	1.90	6.5	Waterloo	64	8	32.2	2.17	8.0
Plumhill	70	0	36.8	3.28	4.2	Cedar Rapids	70	5	33.5	1.67	11.5	Webster City	63	6	30.8	1.69	9.0
Rantoul	71	12	45.0	2.31	1.0	Chariton	69	4	34.8	1.67	11.5	West Bend	67	4	33.5	1.17	4.5
Raum	68	3	35.2	1.34	8.0	Charles City	62	10	30.2	1.51	6.5	West Branch	73	6	37.2	0.33	3.0
Reynolds	65	0	33.6	1.64	5.3	Clarinda	63	9	29.2	1.30	12.0	Whitcheer	67	7	29.6	2.42	15.0
Riley	72	5	40.7	2.52	T.	Clinton	68	3	33.4	1.42	8.5	Whitten ¹	67	5	33.6	1.76	8.5
Robinson	68	4	34.0	1.30	5.5	College Springs	70	7	35.5	0.66	11.						

TABLE II.—Meteorological record of voluntary and other cooperating observers—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.		Stations.	Temperature. (Fahrenheit.)			Precipitation.		Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.		Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.		Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
Kansas—Cont'd.						Louisiana—Cont'd.						Massachusetts.					
Fall River	75	—	38.0	0.81	T.	Amite	80	27	54.1	10.89		Adams	58	10	36.9	Ins.	Ins.
Fanning	75	—	38.0	1.12	4.0	Bastrop	81	22	51.6	6.41		Amherst	61	10	38.4	5.75	11.5
Fort Riley	76	—	39.2	0.34	3.4	Baton Rouge	82	29	54.9	6.39		Attleboro	58	18	38.6	5.64	15.0
Fort Scott	74	10	41.8	2.11		Calhoun	78	23	50.0	7.18		Bedford	62	17	39.6	7.19	23.0
Frankfort	78	—	37.6	0.70	7.0	Cheneyville	83	30	52.6	5.00		Bluehill (summit)	62	17	39.6	7.19	23.0
Garden City	74	—	39.0	1.55	7.0	Clinton	79	28	54.2	5.79		Cambridge a	62	19	40.7	6.63	
Gibson	78	—	36.2	1.00	10.0	Donaldsonville	82	30	55.6	12.93		Chestnut Hill	62	17	40.4	7.42	21.0
Gove	81	0	36.3	0.80	8.0	Emille	79	30	54.6	7.22		Cohasset	63	15	38.6	5.02	16.0
Grenola	73	1	37.7	1.50	1.0	Farmerville	84	23	50.1	6.96	T.	Concord	63	15	38.6	5.02	16.0
Horton	73	1	37.7	1.30		Franklin	85	33	54.8	7.73		Dudley	62	14	38.9	5.72	24.0
Hutchinson	83	9	42.1	1.12	5.7	Grand Coteau	84	29	54.3	6.36		East Templeton	56	14	35.2	6.43	25.5
Independence	76	10	43.6	1.21	0.2	Hammond	82	29	56.5	9.97		Fall River	60	23	42.6	8.04	22.0
Lakin	76	5	39.5	1.47	2.8	Jeanerette	83	27	54.6	8.31		Fiskdale	57	18	37.2	7.27	17.5
Lawrence	77	1	34.8	0.60	6.0	Jennings	85	27	55.3	4.83		Fitchburg a	61	15	38.4	6.76	19.7
Lebanon	75	5	39.3	2.25	2.0	Lafayette	82	28	53.8	8.00		Fitchburg b	61	17	40.0	7.24	19.0
Lebo	78	4	40.6	1.13		Lake Charles	82	29	54.4	6.71		Framingham	61	14	37.2	5.20	15.0
McPherson	78	—	34.2	1.30	8.0	Lake Providence	81	36	59.4	4.76		Groton	60	20	42.3	8.41	7.0
Manhattan b	78	—	34.2	1.30	8.0	Lawrence	81	36	59.4	4.76		Hyannis	60	20	42.3	8.41	7.0
Manhattan c	78	—	34.2	1.30	8.0	Liberty Hill	83	24	50.8	5.97	T.	Jefferson	61	18	39.6	4.63	12.0
Marion	75	0	41.0	0.90	3.0	Mansfield	83	21	50.2	6.37		Lawrence	62	11	36.8	6.54	16.0
Meade	80	7	40.9	1.07	2.5	Melville	81	36	54.0	6.29		Leeds	60	14	36.6	7.23	24.0
Medicine Lodge	80	7	40.9	1.07	2.5	Monroe	81	24	51.6	5.65		Leicester Hill	60	14	36.6	7.23	24.0
Minneapolis	75	—	37.1	1.00	9.0	Montgomery	81	24	48.4	5.75		Leominster	61	17	39.4	6.45	19.0
Morantown	72	8	40.8	1.76	0.5	New Iberia	80	23	54.8	9.25		Lowell	63	18	39.2	5.95	25.0
Mounthope	75	7	40.5	0.90	3.0	Oakridge	83	24	49.2	9.27		Ludlow Center	56	6	34.3	7.60	28.0
Ness City	73	5	39.8	1.12		Opelousas	82	27	53.2	6.80		Mansfield	61	13	37.4	7.00	28.0
Newton	73	5	39.8	1.12		Oxford	82	22	50.4	6.63		Middleboro	62	13	39.8	7.12	18.0
Norwich	72	3	38.9	1.68	4.0	Paincourtville	82	29	55.6	7.97		Monson	60	8	38.7	7.25	28.5
Oberlin	72	3	38.9	1.68	4.0	Plain Dealing	82	22	49.4	5.78		New Bedford a	60	18	41.2	7.98	24.0
Olathe	72	3	38.9	1.68	4.0	Plaquemine	84	30	55.0	7.25		New Bedford b	61	19	41.2	8.28	22.0
Osage City	77	2	40.0	1.61	1.20	Rayne	84	28	54.4	9.50		New Salem	61	12	36.8	6.73	15.2
Osborne	77	11	46.2	1.94	0.5	Robeline	83	18	50.3	6.05		Pittsfield	56	13	36.0	4.92	9.0
Oswego	77	11	46.2	1.94	0.5	Ruston	80	24	51.7	5.29		Plymouth	62	18	41.2	8.52	13.0
Ottawa	74	2	38.2	1.75	4.0	Schriever	86	31	56.4	6.58		Princeton	61	19	41.2	8.28	22.0
Phillipsburg	70	—	32.7	1.30	13.0	Shell Beach	78	31	57.7	7.24		Salem	61	12	36.8	6.73	15.2
Pittsburg	72	11	42.0	1.85	T.	Southern University	80	33	56.2	6.55		Somerset	65	20	42.0	7.62	23.0
Rome	77	10	42.8	1.09	2.0	Sugar Ex. Station	81	34	56.0	7.09		South Clinton	64	17	39.6	6.93	21.0
Russell	76	—	37.8	0.83	8.0	Sugartown	80	28	53.9	5.20		Springfield Armory	64	17	39.6	6.93	21.0
Salina	75	—	37.8	0.83	8.0	Wallace	84	31	57.6	8.04		Sterling	59	15	38.7	8.16	30.0
Scott	77	11	43.0	0.80	2.0	White Sulphur Springs	87	16	52.6	7.94		Taunton b	62	11	38.8	7.51	19.0
Sedan	77	11	43.0	0.84	1.0	Maine.						Turners Falls	59	12	37.5	4.42	8.0
Toronto	78	8	41.4	1.89	1.0	Belfast	52	17	37.3	5.59	12.0	Webster	62	15	40.1	5.95	15.0
Viroqua	83	2	41.0	0.84	6.0	Calais	56	11	37.5	6.82	13.0	Westboro	62	15	40.1	5.95	15.0
Wallace	76	—	36.5	1.56	15.6	Cornish	56	13	35.8	4.48	21.5	Weston	60	16	39.2	6.06	16.8
Wamego	76	12	43.4	1.28	2.0	Cumberland Mills	60	13	39.0	5.09	12.0	Williamstown	58	10	35.8	3.25	
Wellington	81	10	43.8	1.25	2.0	Fairfield	63	15	37.3	8.71	9.0	Winchendon	61	10	35.8	5.99	20.0
Winfield	81	10	43.8	1.25	2.0	Farmington	60	7	35.8	4.40	20.5	Worcester a	60	22	40.8	Ins.	Ins.
Winona	77	6	40.4	1.89	2.0	Flagstaff	61	13	33.3	3.25	26.0	Worcester b	57	16	41.0	8.36	19.2
Yates Center	77	6	40.4	1.89	2.0	Gardiner	58	15	38.8	4.57	14.0	Michigan.					
Kentucky.						Lewiston	64	17	38.2	4.44	18.0	Adrian	67	9	34.4	2.34	3.2
Alpha	76	12	42.6	2.17	0.5	Mayfield	54	7	32.6	6.02	30.0	Agricultural College	68	9	33.1	2.72	13.5
Bardonia	76	12	42.6	2.17	0.5	North Bridgton	60	9	37.9	6.10	26.0	Allegan	67	6	36.6	3.85	33.0
Blandville	74	11	43.6	2.01	0.0	Orono	60	10	35.8	6.84	6.0	Alma	67	5	33.8	3.22	18.0
Bowling Green	73	14	44.4	3.22	0.0	Petit Menan	50	25	36.7	Ins.	Ins.	Ann Arbor	67	9	34.6	3.13	6.2
Burnside	75	12	41.1	4.00	4.0	Winslow	59	14	37.2	3.86	11.5	Arbela	64	9	34.6	2.09	9.0
Caddo	75	12	41.1	4.00	4.0	Maryland.						Baldwin	65	2	34.6	3.02	14.5
Canton	75	15	45.3	2.63	T.	Annapolis	65	25	43.8	4.69	8.0	Ball Mountain	58	10	33.8	2.01	4.5
Carlisle	69	14	41.9	1.78	0.4	Bachmans Valley	64	17	40.4	5.52	11.0	Battle Creek	67	10	35.0	3.16	11.0
Carrollton	72	18	41.8	2.75	T.	Boetherville	65	14	40.9	1.42	5.0	Bay City b	67	13	34.2	2.59	8.0
Catlettsburg	76	11	44.0	2.83	T.	Charlotte Hall	74	23	45.1	2.40	2.0	Berlin	63	7	33.8	3.13	11.2
Earlington	70	15	44.4	2.87	0.1	Cherryfields	67	25	45.9	2.29	T.	Berrien Springs	69	10	35.8	3.57	24.2
Edmonton	72	12	43.5	2.71	2.0	Chestertown	67	25	43.2	5.10	7.0	Big Point Sable	60	14	39.2	Ins.	Ins.
Ensor	72	11	41.6	3.93	0.2	Collegepark	69	28	45.0	4.18	3.0	Big Rapids	67	3	33.4	3.01	10.0
Eubank	72	11	41.6	3.93	0.2	Cumberland b	68	27	46.1	2.94	8.0	Birmingham	64	10	35.4	3.70	5.0
Falmouth	72	11	41.6	3.93	0.2	Darlington	63	24	42.1	5.62	9.0	Bois Blanc	70	18	39.7	Ins.	Ins.
Fords Ferry	75	11	45.0	1.57	T.	Deerpark	66	6	37.5	2.06	4.0	Boon	63	6	32.0	3.39	16.2
Frankfort	70	18	46.6	Ins.		Easton	67	26	43.2	4.14	0.8	Calumet	57	5	32.2	2.57	15.3
Georgetown	70	12	43.8	Ins.		Ellicott City	66	19	41.9	5.00	6.0	Camden	68	6	35.0	2.91	2.8
Greensburg	76	14	42.2	2.77	0.2	Fallston											

TABLE II.—Meteorological record of voluntary and other cooperating observers—Continued.

Temperature. (Fahrenheit.)						Precipitation.		Temperature. (Fahrenheit.)						Precipitation.		Temperature. (Fahrenheit.)						Precipitation.													
Stations.						Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.	Stations.						Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.	Stations.						Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.			
Michigan—Cont'd.										Minnesota—Cont'd.										Missouri—Cont'd.															
Hillsdale.....	66	9	34.0	4.03	7.8	Milaca.....	59	-14	27.8	0.90	9.0	Fayette.....	73	4	38.6	2.22	2.0	Howell.....	66	8	35.4	2.14	6.5	Milan.....	64	-14	26.2	0.62	7.2	Fulton.....	72	1	37.8	2.70	T.
Humboldt.....	59	-7	27.6	1.61	2.0	Minneapolis.....	58	-15	28.7	1.56	13.0	Gallatin*1.....	72	1	37.8	1.02	5.2	Ionia.....	67	5	33.8	1.79	14.0	Montevideo.....	66	-12	31.7	1.96	10.0	Gayoso.....	78	16	47.2	.....	.....
Ishpeming.....	61	5	30.4	1.53	5.9	Minneapolis*1.....	58	-22	26.2	1.46	12.5	Glasgow.....	73	4	39.3	1.94	9.0	Ivan.....	65	13	34.4	1.99	4.2	Morris.....	61	-12	26.6	0.30	3.0	Gordonville*2.....	73	14	40.2	2.39	0.5
Jackson.....	67	10	35.1	3.36	.....	Minnesota City*1.....	62	-11	26.9	0.59	5.2	Mount Iron.....	40	-21	30.9	1.00	10.0	Jackson.....	67	10	35.1	3.36	.....	Newfolden.....	52	-19	20.4	0.77	4.9	Gorin.....	74	9	42.1	1.59	3.8
Jeddo.....	63	11	34.8	3.33	8.5	Montevideo.....	61	-12	26.6	0.30	3.0	Morris.....	61	-12	26.6	0.30	3.0	Jeddo.....	63	11	34.8	3.33	8.5	Mount Iron.....	40	-21	30.9	1.00	10.0	Halfway.....	74	9	42.1	3.79	T.
Kalamazoo.....	66	6	34.5	3.45	4.0	Morris.....	61	-12	26.6	0.30	3.0	Mount Iron.....	40	-21	30.9	1.00	10.0	Kalamazoo.....	66	6	34.5	3.45	4.0	Newfolden.....	52	-19	20.4	0.77	4.9	Harrisonville.....	74	6	38.6	2.27	3.0
Lake City.....	65	10	33.4	.....	.....	Montevideo.....	61	-12	26.6	0.30	3.0	Mount Iron.....	40	-21	30.9	1.00	10.0	Lake City.....	65	10	33.4	.....	.....	New London.....	59	-12	27.0	0.52	5.0	Hermann.....	74	10	43.2	2.31	.....
Lansing.....	66	14	34.3	2.70	18.0	Montevideo.....	61	-12	26.6	0.30	3.0	Mount Iron.....	40	-21	30.9	1.00	10.0	Lansing.....	66	14	34.3	2.70	18.0	New London.....	59	-12	27.0	0.52	5.0	Houston.....	74	10	43.2	2.90	T.
Lapeer.....	66	6	33.4	1.02	5.0	New Richmond*1.....	58	-14	26.4	.....	.....	Mount Iron.....	40	-21	30.9	1.00	10.0	Lapeer.....	66	6	33.4	1.02	5.0	New Richmond*1.....	58	-14	26.4	.....	.....	Houstonla.....	74	10	43.2	2.70	5.2
Lathrop.....	57	2	30.8	0.75	2.0	New Ulm.....	61	-10	26.8	1.05	4.5	Park Rapids.....	55	-21	22.6	0.53	5.3	Lathrop.....	57	2	30.8	0.75	2.0	New Ulm.....	61	-10	26.8	1.05	4.5	Irena.....	76	8	40.9	1.64	5.5
Ludington.....	64	11	33.7	2.10	8.3	Park Rapids.....	55	-21	22.6	0.53	5.3	Pine River.....	56	-23	25.2	0.82	9.5	Ludington.....	64	11	33.7	2.10	8.3	Pine River.....	56	-23	25.2	0.82	9.5	Ironton.....	77	9	41.4	2.27	3.5
Luzerne.....	66	2	32.0	1.87	8.0	Pine River.....	56	-23	25.2	0.82	9.5	Pipestone.....	66	-10	30.0	1.24	9.5	Luzerne.....	66	2	32.0	1.87	8.0	Pipestone.....	66	-10	30.0	1.24	9.5	Jefferson City.....	77	9	41.4	3.33	0.2
Mackinaw City.....	70	15	35.1	1.48	5.0	Pipestone.....	66	-10	30.0	1.24	9.5	Pleasant Mounds.....	66	-10	30.0	1.24	9.5	Mackinaw City.....	70	15	35.1	1.48	5.0	Pleasant Mounds.....	66	-10	30.0	1.24	9.5	Kidder.....	71	-3	36.8	1.78	5.9
Madison.....	67	10	35.9	3.10	4.4	Pleasant Mounds.....	66	-10	30.0	1.24	9.5	Pokegama Falls.....	56	-31	23.0	1.46	17.8	Madison.....	67	10	35.9	3.10	4.4	Pokegama Falls.....	56	-31	23.0	1.46	17.8	Lamar.....	75	11	43.7	1.92	T.
Mancelona.....	68	12	34.8	2.14	8.5	Pokegama Falls.....	56	-31	23.0	1.46	17.8	Redwing.....	66	-10	30.0	1.24	9.5	Mancelona.....	68	12	34.8	2.14	8.5	Redwing.....	66	-10	30.0	1.24	9.5	Lamonte.....	75	11	43.7	2.17	1.0
Manistee.....	66	11	34.0	2.32	13.5	Redwing.....	66	-10	30.0	1.24	9.5	Reeds.....	61	-7	27.5	1.20	12.0	Manistee.....	66	11	34.0	2.32	13.5	Reeds.....	61	-7	27.5	1.20	12.0	Lebanon.....	74	10	43.2	2.15	2.5
Manistique.....	53	10	33.9	1.48	2.0	Reeds.....	61	-7	27.5	1.20	12.0	Rolling Green.....	61	-7	27.5	1.20	12.0	Manistique.....	53	10	33.9	1.48	2.0	Rolling Green.....	61	-7	27.5	1.20	12.0	Lexington.....	73	3	40.8	2.89	3.0
Middle Island*10.....	65	22	37.2	.....	.....	Rolling Green.....	61	-7	27.5	1.20	12.0	St. Charles.....	60	-11	29.8	1.81	9.0	Middle Island*10.....	65	22	37.2	.....	.....	St. Charles.....	60	-11	29.8	1.81	9.0	Liberty.....	75	0	38.6	2.13	3.0
Mottville.....	68	7	35.2	3.45	7.8	St. Charles.....	60	-11	29.8	1.81	9.0	St. Cloud.....	56	-17	27.8	1.85	15.0	Mottville.....	68	7	35.2	3.45	7.8	St. Cloud.....	56	-17	27.8	1.85	15.0	Louisiana.....	75	4	40.8	3.19	0.5
Mount Clemens.....	63	9	35.2	3.91	3.5	St. Cloud.....	56	-17	27.8	1.85	15.0	St. Olaf.....	59	-11	34.4	0.53	3.2	Mount Clemens.....	63	9	35.2	3.91	3.5	St. Olaf.....	59	-11	34.4	0.53	3.2	McCune*11.....	76	4	39.5	3.34	1.0
Mount Pleasant.....	68	7	36.3	2.73	10.5	St. Olaf.....	59	-11	34.4	0.53	3.2	St. Peter.....	61	-11	30.4	1.22	7.5	Mount Pleasant.....	68	7	36.3	2.73	10.5	St. Peter.....	61	-11	30.4	1.22	7.5	Marblehill.....	75	8	40.5	1.79	0.2
Muskellonge Lake*10.....	59	6	34.2	.....	.....	St. Peter.....	61	-11	30.4	1.22	7.5	Sandy Lake Dam.....	55	-29	24.8	1.17	12.0	Muskellonge Lake*10.....	59	6	34.2	.....	.....	Sandy Lake Dam.....	55	-29	24.8	1.17	12.0	Marshall.....	79	7	38.2	2.18	2.9
Muskegon.....	63	5	36.4	2.40	7.0	Sandy Lake Dam.....	55	-29	24.8	1.17	12.0	Shakopee.....	62	-8	30.0	1.11	9.0	Muskegon.....	63	5	36.4	2.40	7.0	Shakopee.....	62	-8	30.0	1.11	9.0	Maryville.....	72	-4	33.0	1.41	12.0
Newberry.....	62	8	33.1	2.37	7.0	Shakopee.....	62	-8	30.0	1.11	9.0	Slayton.....	66	-11	29.2	.....	.....	Newberry.....	62	8	33.1	2.37	7.0	Slayton.....	66	-11	29.2	.....	.....	Mexico.....	74	4	39.8	2.51	2.2
North Manitou Island*10.....	64	16	37.4	.....	.....	Slayton.....	66	-11	29.2	.....	.....	Tower.....	54	-31	23.5	1.70	12.0	North Manitou Island*10.....	64	16	37.4	.....	.....	Tower.....	54	-31	23.5	1.70	12.0	Miami.....	73	6	42.1	1.11	2.2
North Marshall.....	69	7	33.7	.....	.....	Tower.....	54	-31	23.5	1.70	12.0	Two Harbors.....	69	-11	29.9	0.90	9.0	North Marshall.....	69	7	33.7	.....	.....	Two Harbors.....	69	-11	29.9	0.90	9.0	Mineralspring.....	73	6	42.1	2.54	T.
Northport.....	68	16	38.5	2.35	14.5	Two Harbors.....	69	-11	29.9	0.90	9.0	Wabasha*1.....	62	-11	29.8	1.58	10.0	Northport.....	68	16	38.5	2.35	14.5	Wabasha*1.....	62	-11	29.8	1.58	10.0	Montreal.....	74	9	40.8	2.57	3.0
Old Mission.....	68	15	38.2	.....	.....	Wabasha*1.....	62	-11	29.8	1.58	10.0	Willmar.....	59	-12	25.7	0.40	1.5	Old Mission.....	68	15	38.2	.....	.....	Willmar.....	59	-12	25.7	0.40	1.5	Mont Vernon.....	74	10	43.6	2.58	T.
Olivet.....	65	13	34.3	2.81	16.5	Willmar.....	59	-12	25.7	0.40	1.5	Willow River.....	58	-30	27.2	2.70	15.5	Olivet.....	65	13	34.3	2.81	16.5	Willow River.....	58	-30	27.2	2.70	15.5	Neosho.....	74	11	44.6	2.67	T.
Omer.....	69	14	32.9	1.95	10.0	Willow River.....	58	-30	27.2	2.70	15.5	Winnebago City.....	61	-10	27.0	0.31	3.0	Omer.....	69	14	32.9	1.95	10.0	Winnebago City.....	61	-10	27.0	0.31	3.0	Nevada.....	72	8	39.8	1.81	1.0
Ottawa Point*10.....	56	19	37.1	.....	.....	Winnebago City.....	61	-10	27.0	0.31	3.0	Worthington.....	61	-10	27.0	0.31	3.0	Ottawa Point*10.....	56	19	37.1	.....	.....	Worthington.....	61	-10	27.0	0.31	3.0	New Haven.....	77	9	41.9	2.08	T.
Ovid.....	67	9	34.2	1.59	11.0	<i>Mississippi.</i>						Ovid.....	67	9	34.2	1.59	11.0	Owosso.....	70	10	34.5	2.52	12.0	New Madrid.....	78	18	.....	3.67	T.						
Owosso.....	70	10	34.5	2.52	12.0	Aberdeen.....	76	24	48.3	2.30	.....	Owosso.....	70	10	34.5	2.52	12.0	Owosso.....	70	10	34.5	2.52	12.0	New Palestine.....	71	8	41.6	1.91	0.4						
Parkville.....	66	18	41.0	.....	.....	Agricultural College.....	79	21	51.4	5.00	.....	Parkville.....	66	18	41.0	.....	.....	Parkville.....	66	18	41.0	.....	.....	Oakfield.....	76	9	42.8	2.35	0.1						
Pentwater*10.....	66	18	41.0	.....	.....	Austin.....	80	20	49.8	3.42	.....	Pentwater*10.....	66	18	41.0	.....	.....	Pentwater*10.....	66	18	41.0														

TABLE II.—Meteorological record of voluntary and other cooperating observers—Continued.

Temperature. (Fahrenheit.)						Precipitation.		Temperature. (Fahrenheit.)						Precipitation.		Temperature. (Fahrenheit.)						Precipitation.	
Maximum.		Minimum.		Mean.		Rain and melted snow.	Total depth of snow.	Maximum.		Minimum.		Mean.		Rain and melted snow.	Total depth of snow.	Maximum.		Minimum.		Mean.		Rain and melted snow.	Total depth of snow.
Stations.								Stations.									Stations.						
New Mexico—Cont'd.						New York—Cont'd.						North Dakota—Cont'd.											
Los Lunas.....	65	10	38.4	1.00	8.0	Schenectady.....	60	13	36.6	.....	.....	.....	.....	.....	.....	Napoleon.....	60	-20	23.1	0.48	4.5
Lower Penasco.....	76	12	44.0	0.30	3.0	Setauket.....	62	22	43.0	6.28	16.0	.....	.....	.....	.....	New England City.....	64	-13	24.3	0.25	2.5
Mesilla Park.....	81	9	46.0	0.43	.....	Sherwood.....	.....	.....	.....	3.48	.....	.....	.....	.....	.....	Power.....	58	-17	22.4	0.40	4.0
Monero.....	65	-12	29.7	0.55	6.0	Skaneateles.....	.....	.....	.....	3.95	.....	.....	.....	.....	.....	Sheyenne.....	54	-17	22.4	0.08	0.8
Puerto de Luna.....	74	16	44.0	0.75	5.5	South Canisteo.....	65	9	36.4	3.33	4.0	.....	.....	.....	.....	Steele.....	56	-17	22.5	T.	T.
Raton.....	72	5	38.0	0.40	4.0	Southeast Reservoir.....	.....	.....	.....	6.34	16.8	.....	.....	.....	.....	Towner.....	55	-19	23.0	.....	.....
Rincon.....	82	14	48.0	T.	.....	South Kortright.....	57	5	34.8	3.88	.....	.....	.....	.....	.....	University.....	59	-8	25.4	T.	T.
Roswell.....	85	10	44.8	0.50	1.5	Straits Corners.....	60	14	34.0	3.07	3.1	.....	.....	.....	.....	Valley City.....	60	-16	24.1	0.68	6.0
San Marcial.....	78	14	45.1	0.58	4.0	Wappingers Falls.....	65	13	40.0	5.74	19.0	.....	.....	.....	.....	Wahpeton.....	66	-13	26.8	0.66	6.0
Shattucks Ranch.....	77	16	44.8	0.78	1.0	Warwick.....	.....	.....	.....	5.21	.....	.....	.....	.....	.....	Willow City.....	54	-24	23.0	0.30	3.0
Socorro.....	74	14	41.8	0.69	4.0	Watertown.....	67	5	36.3	3.02	6.5	.....	.....	.....	.....	Woodbridge.....	58	-22	19.3	0.22	2.2
White Oaks.....	68	13	41.8	0.25	1.5	Waverly.....	64	18	38.2	2.55	3.3	.....	.....	.....	.....	Ohio.....	.....	.....	.....	.....	.....
Windsor Ranch.....	68	-2	30.2	1.55	.....	Wedgwood.....	64	13	36.8	2.73	2.5	.....	.....	.....	.....	Akron.....	66	13	38.8	3.89	4.2
New York.						West Berns.....	70	13	38.2	5.19	8.0	.....	.....	.....	.....	Annapolis.....	64	5	37.0	3.08	2.0
Adams.....	63	18	38.7	2.13	2.5	Westfield.....	68	16	40.0	2.85	4.0	.....	.....	.....	.....	Ashland.....	68	9	37.0	3.76	8.0
Addison.....	63	18	38.7	2.13	2.5	Westpoint.....	64	18	40.1	6.29	.....	.....	.....	.....	.....	Ashtabula.....	65	20	40.0	4.15	3.0
Alden.....	66	3	35.9	3.70	3.5	Willets Point.....	63	10	42.2	6.18	20.0	.....	.....	.....	.....	Atwater.....	.....	.....	.....	2.87	3.5
Alfred.....	63	13	38.0	2.99	1.2	North Carolina.						Bangorville.....	70	9	38.8	4.62	3.0						
Angelica.....	63	12	37.2	3.00	2.0	Abshers.....	72	16	43.6	3.19	2.0	.....	.....	.....	.....	Basil.....	.....	.....	.....	2.07	T.
Appleton.....	68	20	38.8	2.74	2.4	Ashville.....	.....	.....	.....	1.87	.....	.....	.....	.....	.....	Bement.....	.....	.....	.....	4.05	2.8
Arcade.....	62	11	35.9	3.79	4.7	Beaufort.....	72	27	53.2	4.14	.....	.....	.....	.....	.....	Benton Ridge.....	66	6	37.0	2.83	3.6
Atlanta.....	.....	.....	.....	.....	.....	Biltmore.....	70	14	44.3	1.91	T.	.....	.....	.....	.....	Bethany.....	69	11	40.5	3.46	1.0
Auburn.....	68	12	40.0	3.65	3.0	Bryson City.....	.....	.....	.....	3.66	T.	.....	.....	.....	.....	Big Prairie.....	66	12	39.2	4.25	3.5
Avon.....	65	9	36.9	2.72	.....	Chapel Hill.....	74	22	47.0	2.98	T.	.....	.....	.....	.....	Binola.....	.....	.....	.....	2.90	4.5
Baldwinsville.....	65	15	38.6	3.31	4.0	Edenton.....	71	26	49.6	3.84	.....	.....	.....	.....	.....	Bloomingsburg.....	69	12	40.0	2.74	2.0
Bedford.....	68	13	40.1	6.16	35.2	Experimental Farm.....	73	24	48.0	2.65	0.5	.....	.....	.....	.....	Bowling Green.....	69	3	36.6	2.70	3.5
Big Sandy.....	62	11	37.7	.....	.....	Fairbluff.....	.....	.....	.....	5.44	.....	.....	.....	.....	.....	Bucyrus.....	68	8	36.3	.....	.....
Bolivar.....	65	10	36.6	3.40	4.0	Fayetteville.....	77	22	50.4	4.95	.....	.....	.....	.....	.....	Cambridge.....	67	9	37.5	2.18	3.0
Bouckville.....	55	8	34.6	3.32	7.0	Flatrock.....	68	14	42.2	3.98	.....	.....	.....	.....	.....	Camp Dennison.....	68	13	40.8	2.93	1.0
Boys Corners.....	.....	.....	.....	6.81	22.8	Greensboro.....	70	22	45.0	2.45	.....	.....	.....	.....	.....	Canal Dover.....	66	12	38.5	3.00	4.0
Brentwood.....	65	13	40.2	8.90	24.5	Henderson.....	71	23	46.3	3.40	0.3	.....	.....	.....	.....	Canton.....	73	13	39.4	3.90	3.8
Canton.....	65	3	34.0	2.01	4.5	Hendersonville.....	70	14	43.8	3.08	.....	.....	.....	.....	.....	Carrollton.....	70	7	39.4	2.93	4.0
Carmel.....	64	17	40.0	6.51	18.0	Horse Cove.....	64	11	43.6	6.32	1.1	.....	.....	.....	.....	Celina.....	68	3	38.2	2.86	4.0
Carvers Falls.....	62	5	34.9	3.39	9.0	Lenoir.....	67	22	44.6	3.32	0.1	.....	.....	.....	.....	Circleville.....	72	14	40.6	2.75	1.0
Cedarhill.....	75	7	39.0	4.01	7.5	Linville.....	58	9	37.9	2.54	2.0	.....	.....	.....	.....	Clarksburg.....	70	11	41.3	3.15	1.7
Charlotte.....	62	15	35.4	.....	.....	Littletown.....	72	21	45.4	3.24	T.	.....	.....	.....	.....	Cleveland.....	67	18	40.0	3.78	.....	
Chenango Forks.....	.....	.....	.....	3.70	.....	Louisburg.....	73	21	47.3	2.96	0.5	.....	.....	.....	.....	Cleveland.....	68	18	39.3	2.41	2.2
Cherry Creek.....	.....	.....	.....	5.27	.....	Lumberton.....	74	25	49.5	4.97	.....	.....	.....	.....	.....	Clinton.....	69	8	38.4	4.82	2.5
Cooperstown.....	57	12	35.5	4.64	7.0	Mana.....	.....	.....	.....	2.72	T.	.....	.....	.....	.....	Coalton.....	68	10	39.8	3.09	1.0
Cortland.....	61	15	38.2	3.10	0.2	Marion.....	71	20	44.8	3.27	2.0	.....	.....	.....	.....	Colebrook.....	67	7	38.4	3.69	4.0
Dekalb Junction.....	.....	.....	.....	2.08	.....	Marshall.....	69	12	42.6	1.65	T.	.....	.....	.....	.....	Dayton.....	71	10	40.9	4.30	2.2
Eagle Mills.....	.....	.....	.....	3.30	.....	Mocksville.....	75	22	47.4	2.86	T.	.....	.....	.....	.....	Dayton.....	.....	.....	.....	4.48	1.8
Easton.....	.....	.....	.....	4.04	.....	Moncure.....	72	22	47.8	2.53	.....	.....	.....	.....	.....	Defiance.....	69	8	36.0	3.20	4.1
Elmira.....	64	18	39.6	2.24	2.5	Monroe.....	75	18	47.5	3.22	T.	.....	.....	.....	.....	Delaware.....	69	10	38.0	4.30	2.5
Fayetteville.....	64	15	39.2	2.21	4.0	Mountairy.....	68	19	43.0	1.94	2.1	.....	.....	.....	.....	Demos.....	65	13	38.2	2.01	3.0
Fleming.....	64	15	39.2	2.21	4.0	Mount Pleasant.....	73	21	47.3	2.37	.....	.....	.....	.....	.....	Elyria.....	69	13	38.9	3.22	1.5
Fort Niagara.....	68	18	39.6	2.33	.....	Murphy.....	.....	.....	.....	3.45	T.	.....	.....	.....	.....	Findlay.....	70	5	36.8	3.13	4.5
Franklinville.....	65	8	36.5	4.02	2.6	Newbern.....	80	25	53.0	3.56	T.	.....	.....	.....	.....	Frankfort.....	67	13	40.0	2.25	0.5
Fulton.....	61	10	37.2	3.50	6.0	Oakridge.....	72	21	45.9	2.53	T.	.....	.....	.....	.....	Garrettsville.....	69	3	37.8	4.60	5.5
Glens Falls.....	61	10	37.2	3.50	6.0	Pantego.....	.....	.....	.....	2.86	.....	.....	.....	.....	.....	Granville.....	65	12	37.6	3.00	2.5
Gloversville.....	60	9	34.7	4.64	7.6	Patterson.....	61	22	41.0	3.13	T.	.....	.....	.....	.....	Gratott.....	67	12	40.0	2.55	2.0
Greenwich.....	60	4	35.6	3.53	6.0	Pittsboro.....	81	19	47.8	2.54	1.0	.....	.....	.....	.....	Greenhill.....	68	4	37.3	3.38	4.0
Haskinsville.....	.....	.....	.....	2.97	.....	Rockingham.....	74	21	48.8	4.21	.....	.....	.....	.....	.....	Greenville.....	64	10	38.4	3.05	2.5
Hemlock Lake.....	62	17	39.2	2.56	3.0	Salem.....	70	19	45.4	2.63	.....	.....	.....	.....	.....	Hackney.....	.....	.....	.....	2.56	4.0
Honeymead Brook.....	60	8	36.8	4.71	13.5	Salisbury.....	73	23	47.8	3.26	.....	.....	.....	.....	.....	Hang Rock.....	.....	.....	.....	2.79	.....	
Humphrey.....	66	12	37.0	3.15	8.3	Saxon.....	70	16	45.0	2.51	T.	.....	.....	.....	.....	Hedges.....	69	5	35.8	2.87	0.2
Ithaca.....	61	16	39.0	3.15	4.1	Selma.....	74	22	48.4	3.36	T.	.....	.....	.....	.....	Hillhouse.....	70	14	37.6	4.32	7.0
Jameson.....	64	11	38.6	4.70	8.6	Settle.....	68	17	43.2	2.10	T.	.....	.....	.....	.....	Hillsboro.....	75	9	41.4	2.94	0.5
Keene Valley.....	59	1	33.2	2.53	13.5	Sloan.....	77	25	53.0	4.11	T.	.....										

TABLE II.—Meteorological record of voluntary and other cooperating observers—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
<i>Ohio—Cont'd.</i>	°	°	°	Ins.	Ins.
Portsmouth a	72	15	42.4	2.54	1.0
Portsmouth b	71	10	39.8	3.63	3.0
Richwood	68	9	36.0	2.96	5.0
Ridgeville Corners	67	11	40.6	3.42	2.6
Ripley	65	6	35.8	4.49	4.0
Rockyridge	70	8	37.8	3.25	2.0
Rosewood	68	10	37.6	2.83	1.5
Seaman	68	11	40.7	3.13	1.0
Shenandoah	67	4	35.8	3.38	4.1
Sidney b	68	10	37.1	3.76	3.0
Sinking Spring	66	14	40.0	3.16	1.5
Somerset	67			2.34	1.8
Springboro				3.80	
Strongsville				3.36	2.5
Sylvania	68	8	34.3	3.63	6.0
Thurman	73	11	41.2	2.20	T.
Tiffin	65	11	38.1	2.97	4.5
Upper Sandusky	76	8	39.5	3.50	3.0
Urbana	63	10	37.8	3.18	3.5
Vanceburg	70	12	40.6	2.40	T.
Van Wert	69	6	36.6	2.84	4.0
Vermillion	68	8	38.2	2.90	6.0
Vicksburg	68	8	37.4	2.72	2.3
Walnut				2.55	1.1
Warren	68	13	38.4	3.58	6.8
Warsaw	69	9	38.4	3.40	3.0
Wauseon	69	8	36.5	3.39	5.6
Waverly	73	13	41.0	3.50	2.2
Waynesville	64	12	37.4	3.31	1.8
Wellington	67	8	38.2	3.09	4.0
Westerville	66	12	39.6	3.45	2.5
Wooster b	66	11	38.4	4.14	4.5
Youngstown	67	16	38.0	3.06	0.5
Zanesville				2.24	1.9
<i>Oklahoma.</i>	82°	13°	47.9°	1.25	
Anadarko	83	12	49.9	0.98	0.5
Arapahoe	84	14	47.5	0.82	T.
Burnett	83	12	45.5	0.90	
Clifton	80	6	45.0	1.21	
Fort Sill	80	15	47.6	0.70	T.
Guthrie				0.95	
Hennessey	84	9	42.0	0.61	2.0
Hopeton	80	6	46.0	0.65	1.0
Jefferson	85	13	46.6	0.90	T.
Kingfisher	87	16	46.1	0.55	T.
Mangum	80	10	43.9	0.96	0.2
Newkirk	82	5	44.0	0.50	
Norman	78	13	43.4	0.82	0.4
Pawhuska	80	10	44.7	0.99	1.2
Perry	77	8	42.0	0.69	
Prudence	80	12	43.0	0.50	T.
Sac and Fox Agency	83	14	46.0	0.68	0.3
Stillwater	82	16	46.1	0.95	T.
Waukomis				0.88	0.5
Winview	84	10	41.6	0.44	2.5
Woodward					
<i>Oregon.</i>	64	28	45.0	7.88	T.
Albany a				7.56	
Albany b	62	25	41.5	1.12	T.
Arlington	68	22	42.4	3.86	0.3
Ashland b	58	27	42.9	5.41	
Aurora	58	27	43.2	6.62	
Aurora (near)	60	30	48.6	12.25	
Bandon	72	30	45.8	16.42	
Bay City	64	7	32.7	1.89	6.5
Beulah	62	27	43.1	7.17	
Brownsville	64	2	30.4	1.40	14.0
Burns	70	8	37.4	2.00	1.0
Burns (near)	56	32	42.2	16.75	
Cascade Locks	62	34	45.8	12.67	
Comstock				9.98	
Coquille River	60	26	43.4	8.63	
Corvallis	63	11	38.8	1.01	0.5
Dayville				1.20	
Ella	70	29	48.4	14.13	
Fairview	58	28	43.2	12.26	
Falls City	60	25	42.7	6.85	
Forestgrove	60	34	47.8	15.00	
Gardiner	59	28	43.2	19.09	2.0
Glenora	59	16	33.4	19.83	94.0
Government Camp	67	22	43.8	3.87	
Grants Pass a	62	5	32.9	1.89	9.5
Happy Valley	62	21	38.4	2.38	3.9
Heppner	55	27	39.4	7.35	5.0
Hood River (near)	62	25	41.6	4.82	0.5
Jacksonville	50	5	28.6	1.68	16.4
Joseph	72	28	46.9	8.46	
Junction City	66	22	43.6	7.96	
Kerby	58	14	35.6	2.06	5.0
Klamath Falls	60	28	43.2	7.26	
Lafayette	59	11	35.5	3.25	
Lagrange	61	7	34.6	1.25	4.0
Lakeview	73	30	51.6	16.56	
Langlois	58	26	42.6	7.75	
McMinnville					
<i>Oregon—Cont'd.</i>	°	°	°	Ins.	Ins.
Merlin	62	20	39.8	3.46	
Monmouth a	65	29	45.1	10.10	
Monmouth b	59	26	44.4		
Monroe	60	26	44.1	11.13	T.
Mount Angel	58	28	43.8	9.18	
Nehalem				15.13	
Newberg	59	27	43.8	6.63	
Newport	62	34	47.5	11.29	
Pendleton	62	20	40.8	2.08	2.0
Placer				5.48	0.5
Prineville	73	9	42.3	2.60	
Riddles	62	32	43.6	6.11	
Salem	60	28	44.6	6.82	
Sheridan	56	30	44.4	7.75	
Silver Lake	61	0	33.6	2.03	16.0
Silverton	66	30	45.2	7.15	
Siskiyou	68	36	44.7	1.40	12.0
Sparta	52	14	31.0	6.01	41.0
Springfield	63	30	44.0	6.26	
Stafford	56	28	41.2	7.75	
The Dalles	58	27	42.0	2.13	T.
Tillamook Rock				5.97	
Toledo	73	32	50.4	11.15	
Umatilla				1.21	0.8
Vale	65	7	32.0	1.11	
Vernonia				6.43	T.
West Fork	62	30	45.2	5.36	
Weston	60	20	37.6	5.24	6.8
Williams	65	20	43.4	4.40	
<i>Pennsylvania.</i>	°	°	°	Ins.	Ins.
Altoona	65	16	38.9	2.14	
Aqueduct	68	27	43.0	2.75	5.5
Athens	64	18	38.6	2.39	3.0
Beaver Dam				2.57	
Bethlehem				5.23	
Brookville				3.09	3.7
Brookville Lock				6.64	
Cameron				2.83	2.0
Carlisle	62	24	40.8	4.39	7.7
Cassandra	62	16	38.2	2.51	7.5
Cedarburg				2.05	0.8
Centerburg	59	20	39.2	3.60	4.0
Chambersburg	65	20	39.4	3.15	9.5
Coatesville	67	20	42.3	6.59	11.4
Confluence				3.41	8.0
Coopersburg	67	19	43.8	7.22	18.5
Davis Island Dam				2.45	
Derry Station	69	6	40.3	3.21	7.0
Doylestown				6.28	
Driftwood				2.43	0.5
Duncannon				3.90	4.8
Dushore	57	11	36.1	3.53	4.4
Dyberry	63	10	36.1	5.10	11.0
East Bloomsburg				1.21	0.8
East Mauch Chunk	63	16	40.2	4.76	5.0
Easton	62	20	40.8	6.22	13.8
Ellwood Junction				2.57	2.8
Emporium	65	12	39.1	3.37	4.4
Everett	63	17	37.6	2.07	3.2
Farrandville				2.74	2.0
Forks of Nesquehanna	72	25	44.0	6.48	
Franklin	68	6	38.7	3.89	0.4
Frederick				6.17	
Freeport				3.43	8.0
Girardville				5.00	13.2
Gramplan	60	16	36.8	3.55	6.0
Greensboro	70	15	41.4	2.66	2.0
Hamburg	63	18	42.0	4.69	9.0
Hawley	63	14	37.0	4.95	9.9
Hells Island Dam				2.17	2.5
Hollidaysburg	67	16	40.1	1.44	3.7
Huntingdon	65	21	42.0	2.23	4.0
Huntingdon b				2.02	
Irwin				2.65	
Johnstown	73	17	40.8	3.15	7.0
Karthauss				1.86	8.0
Keating				2.24	3.0
Kennett Square	65	22	42.6	6.54	9.0
Lansdale				5.38	
Lawrenceville	67			2.04	2.5
Lebanon	64	20	41.4	5.54	16.2
Leroy	62	14	37.6	2.62	3.8
Lewisburg	61	22	40.4	2.33	3.9
Look Haven a	64	20	41.2	2.39	1.8
Look Haven b				2.24	4.0
Look No. 4				2.41	
Lycippus	69	12	40.2	2.89	6.0
Mifflin				3.10	2.0
Nisbet				1.85	2.3
Oil City				4.33	4.2
Ottaville				7.25	
Parker				3.18	4.0
Philadelphia	64	23	44.7	7.00	12.5
Point Pleasant				6.47	
Quakertown	62	15	41.3	7.34	18.5
Reading				5.64	
<i>Pennsylvania—Cont'd.</i>	°	°	°	Ins.	Ins.
Reedsville	62	20	40.4	2.11	
Renovo a				2.18	4.0
Renovo b	66	18	40.9	2.53	3.5
Ridgway				2.59	3.5
Saegertown	68	2	38.8	4.78	5.1
St. Marys				3.90	
Salem Corners	61	12	36.7	5.07	11.0
Seranton	61	14	38.8	3.34	5.0
Seisholtzville				7.03	
Selinsgrove	62	20	40.9	2.90	5.0
Shawmont				5.93	10.6
Shinglehouse	62	10	36.1	4.00	0.8
Sinamahoning				3.33	
Smithport	67	10	36.6	4.00	
Smiths Corners				6.17	
Somerset	66	10	36.1	2.91	10.0
South Eaton	61	15	39.2	3.27	5.0
State College	62	10	38.2	2.28	3.8
Swarthmore	62	25	41.5	4.60	11.0
Towanda	59	13	37.9	2.91	5.5
Trout Run				2.77	3.5
Uniontown	70	16	41.6	3.99	8.0
Warren				4.30	5.7
Wellsboro	64	18	39.0	2.83	2.0
West Chester	63	23	42.3	6.82	14.0
West Newton				2.87	8.0
Westtown	63	21	41.4	6.06	9.5
White Haven	64	14	37.8	4.18	7.0
Wilkesbarre	61	18	38.1	3.90	9.5
Williamsport	60	21	40.8	1.97	1.5
York	65	20	41.0	4.75	9.3
<i>Rhode Island.</i>	°	°	°	Ins.	Ins.
Bristol	59	24	42.4	7.31	21.0
Kingston	60	18	40.2	7.44	20.0
Lonsdale				6.58	19.0
Pawtucket	63	21	41.2	7.04	18.0
Providence a	60	24	41.8	7.59	20.0
Providence c	60	20	40.9	6.91	17.0
<i>South Carolina.</i>	°	°	°	Ins.	Ins.
Allendale	79	23	53.8	5.80	
Anderson				3.27	
Batesburg	75	23	50.2	5.20	
Blackville	81	26	52.6	5.05	
Camden				4.70	
Central	72	19	47.3	3.52	T.
Charaw a	76	23	49.6	3.92	
Charaw b				4.61	
Clemson College	72	14	44.3	3.01	
Conway				4.43	
Darlington				5.62	
Edisto				5.71	
Edinburgh				5.13	
Gaffney				2.90	
Georgetown	77	28	55.8	5.30	
Gillisonville	80	34	54.7	6.41	
Greenville	72	22	46.1	3.25	T.
Greenwood				3.85	
Holland	74	18	46.8	3.52	0.5
Kingstree a	76	26			

TABLE II.—Meteorological record of voluntary and other cooperating observers—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.		Stations.	Temperature. (Fahrenheit.)			Precipitation.		Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.		Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.		Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
<i>South Dakota—Cont'd.</i>						<i>Texas—Cont'd.</i>						<i>Utah—Cont'd.</i>					
Plandreau.....	63	-11	28.1	0.52	3.5	Arthur City.....	85	30	59.6	0.71	1.49	Ogdena.....	63	18	37.8	1.12	4.0
Forestburg.....	67	-20	24.5	0.13	1.3	Austin.....	85	26	52.9	0.30	0.71	Pahreah.....	74	17	42.5	T.	T.
Forest City.....	70	-15	25.2	0.10	1.0	Austin.....	81	20	49.9	0.30	0.30	Parowan.....	72	8	34.9	0.72	7.2
Fort Meade.....	75	-10	31.4	0.33	3.2	Ballinger.....	81	20	49.9	0.30	0.30	Pinto.....	63	2	32.6	0.11	4.0
Gary.....	69	-9	28.8	0.40	2.5	Beaumont.....	94	31	58.6	4.50	4.50	Promontory.....	49	19	34.4	1.08	1.08
Goudyville.....	64	-12	29.2	0.35	2.0	Beeville.....	84	27	53.0	2.16	2.16	Provo.....	77	15	39.2	1.08	1.08
Harney.....	74	-16	32.6	0.19	4.0	Boerne.....	87	33	57.6	4.84	4.84	Richfield.....	76	4	38.8	T.	T.
Hotchkiss.....	75	-16	32.6	0.30	2.0	Brazoria.....	87	33	57.6	3.47	3.47	St. George.....	81	13	42.8	T.	T.
Howard.....	60	-20	26.5	0.15	1.5	Brenham.....	86	28	55.6	3.47	3.47	Scipio.....	72	1	34.4	1.36	6.0
Interior.....	72	-13	27.6	0.30	2.0	Brighton.....	87	33	57.6	3.50	3.50	Snowville.....	64	3	34.2	1.16	6.0
Ipawich.....	68	-12	28.6	0.05	0.5	Brownwood.....	80	22	49.0	0.45	0.45	Soldier Summit.....	57	-2	32.5	1.15	11.5
Kimball.....	60	-12	28.6	0.33	3.2	Burnet.....	84	26	50.8	3.82	3.82	Terrace.....	72	15	36.5	1.46	9.5
Leslie.....	80	-20	27.6	0.40	4.0	Coleman.....	82	22	51.2	0.49	0.49	Tooele.....	65	8	34.8	T.	T.
Menno.....	66	-10	29.2	0.33	3.2	College Station.....	77	28	53.2	2.18	2.18	Vernal.....	64	7	31.4	0.39	3.6
Millbank.....	60	-11	25.4	0.40	4.0	Colorado.....	88	28	55.2	0.46	0.46	Woodruff.....	61	-8	27.0	0.97	15.0
Mitchell.....	67	-13	28.6	0.36	4.5	Columbia.....	87	28	54.7	5.18	5.18	<i>Vermont.</i>					
Montrose.....	63	-10	26.8	0.41	2.0	Conroe.....	82	24	53.2	2.21	2.21	Bennington.....	63	5	36.6	4.39	9.0
Nowlin.....	72	-19	25.9	0.30	3.0	Corsicana.....	82	24	53.2	2.21	2.21	Brattleboro.....	62	9	39.2	6.20	16.0
Oelrichs.....	67	-18	28.7	0.43	4.3	Cuero.....	82	32	54.6	2.43	2.43	Burlington.....	62	12	38.4	1.90	9.5
Parker.....	66	-10	29.2	0.30	2.0	Dallas.....	85	24	50.0	2.52	2.52	Chelsea.....	52	2	31.2	2.82	20.0
Plankinton.....	65	-13	26.2	0.20	1.0	Danevang.....	88	27	57.6	2.32	2.32	Cornwall.....	58	5	34.4	1.30	9.0
Reedfield.....	70	-13	26.0	0.28	3.0	Dublin.....	92	27	57.4	1.34	1.34	Enosburg Falls.....	62	-3	33.8	1.90	9.0
Richford.....	56	-15	26.2	1.03	9.0	Duval.....	92	27	57.4	1.34	1.34	Hartland.....	59	-1	33.5	4.67	19.5
Shiloh.....	60	-14	27.2	T.	T.	Emory.....	88	21	52.1	2.18	2.18	Jacksonville.....	51	10	32.5	5.72	19.0
Sioux Falls.....	65	-12	26.6	0.68	4.5	Estelle.....	90	20	49.5	1.00	1.00	Norwich.....	60	0	32.8	3.87	16.0
Spearsfish.....	60	-7	29.4	0.18	3.5	Forestburg.....	98	30	61.3	0.92	0.92	St. Johnsbury.....	56	-2	32.4	2.63	12.0
Tyndall.....	66	-10	28.2	0.30	3.0	Fort McIntosh.....	98	34	63.7	1.01	1.01	Vernon.....	59	9	37.0	2.94	15.0
Watertown.....	67	-15	25.2	0.15	1.5	Fort Ringgold.....	98	34	63.7	1.01	1.01	Wells.....	58	9	34.6	3.56	10.5
Waubay.....	58	-15	23.8	0.35	3.5	Fort Stockton.....	86	25	51.7	2.24	2.24	Woodstock.....	54	-2	31.8	3.94	20.0
Wentworth.....	63	-10	27.2	0.36	2.6	Fredericksburg.....	89	30	51.0	3.72	3.72	<i>Virginia.</i>					
Wessington Springs.....	61	-13	26.6	T.	T.	Fruitland.....	85	26	52.2	1.78	1.78	Alexandria.....	68	24	44.5	2.87	1.8
Whiteswan.....	67	-8	31.2	0.32	3.2	Georgetown.....	85	26	52.2	1.78	1.78	Ashland.....	72	20	45.8	1.93	T.
Wolsey.....	67	-8	31.2	0.16	1.5	Golingo.....	81	21	51.6	2.96	2.96	Bedford City.....	70	21	44.3	2.05	2.5
<i>Tennessee.</i>						Grapevine.....	86	15	47.8	0.75	0.75	Bigstone Gap.....	72	13	42.6	3.68	0.5
Andersonville.....	69	14	42.2	3.78	T.	Hale Center.....	88	32	56.8	1.92	1.92	Blacksburg.....	76	11	41.0	1.89	2.0
Ashwood.....	72	17	46.4	3.52	T.	Hallettsville.....	82	22	48.6	0.31	0.31	Buckingham.....	72	16	42.8	2.17	0.1
Benton (near).....	72	12	43.6	2.16	T.	Henrietta.....	82	22	48.6	0.31	0.31	Burke's Garden.....	62	6	38.8	3.05	2.5
Bluff City.....	74	16	47.1	2.94	T.	Hewitt.....	82	22	48.6	0.31	0.31	Callville.....	71	20	45.7	3.35	3.0
Bolivar.....	68	14	41.6	2.32	T.	Honeygrove.....	87	32	56.1	5.28	5.28	Charlottesville.....	68	24	45.2	2.07	...
Bristol.....	71	13	45.1	3.50	0.3	Houston.....	85	29	57.4	1.87	1.87	Christiansburg.....	62	24	45.2	2.07	...
Byrdstown.....	71	13	45.1	3.50	0.3	Hulen.....	84	28	52.4	4.14	4.14	Clarksburg.....	62	24	45.2	2.07	...
Carthage.....	77	15	47.0	3.38	T.	Huntsville.....	85	20	53.1	4.32	4.32	Clifton Forge.....	62	20	39.8	...	...
Charleston.....	71	15	46.1	4.48	T.	Jacksonville.....	85	30	56.6	5.97	5.97	Colemans Falls.....	72	21	45.8	2.91	3.0
Clarksville.....	71	15	46.1	4.48	T.	Jasper.....	85	30	56.6	5.97	5.97	Dale Enterprise.....	67	10	40.1	1.82	1.0
Clinton.....	72	15	45.2	3.15	T.	Junction.....	90	21	50.6	1.00	1.00	Doswell.....	73	18	45.4	3.47	T.
Decatur.....	72	15	45.2	3.15	T.	Kent.....	90	21	50.6	1.00	1.00	Dwale.....	71	26	45.0	2.68	0.2
Dover.....	77	14	45.9	2.88	T.	Kerrville.....	86	19	47.8	2.43	2.43	Fredericksburg.....	71	26	45.0	2.07	1.0
Elizabethton.....	73	15	43.5	2.22	T.	Lampasas.....	80	30	53.8	3.07	3.07	Graham's Forge.....	65	13	38.2	1.55	0.1
Elk Valley.....	74	12	42.8	2.86	T.	Llano.....	84	26	50.7	3.60	3.60	Hampton.....	71	28	49.8	3.20	T.
Erasmus.....	74	6	41.8	4.13	T.	Longview.....	87	30	56.2	2.49	2.49	Leesburg.....	68	22	41.7	1.83	1.8
Florence.....	73	16	46.0	3.27	T.	Luling.....	85	23	53.4	3.40	3.40	Lexington.....	69	16	42.8	2.10	1.5
Franklin.....	72	16	45.8	3.63	T.	Mann.....	80	24	53.6	4.28	4.28	Manassas.....	68	25	43.4	1.86	1.2
Grace.....	70	15	47.7	3.40	T.	Marshall.....	82	16	49.6	0.00	0.00	Marion.....	70	19	42.2	2.30	1.0
Greeneville.....	71	10	43.4	2.57	T.	Menardville.....	84	12	46.7	0.02	0.02	Miller School.....	71	22	47.0	2.08	...
Harriman.....	71	16	43.4	4.53	T.	Mount Blanco.....	84	12	46.7	0.02	0.02	Petersburg.....	72	22	48.4	2.43	1.5
Hohenwald.....	73	11	45.6	4.31	T.	New Braunfels.....	84	32	54.8	1.34	1.34	Quantico.....	62	24	43.0	...	...
Jackson.....	74	18	47.6	3.17	T.	Panther.....	82	46	65.8	1.53	1.53	Richmond (near).....	70	20	45.1	2.93	1.2
Johnsonville.....	77	13	45.8	4.67	T.	Point Isabel.....	85	16	48.0	0.73	0.73	Rocky Mount.....	69	18	44.3	2.44	1.0
Jonesboro.....	68	18	42.5	2.73	0.2	Rheinland.....	87	14	50.3	0.31	0.31	Salem.....	70	21	46.4	1.50	2.5
Kingston.....	71	14	44.2	4.03	T.	Roby.....	84	42	61.3	...	...	Spears Ferry.....	77	22	46.6	4.77	1.0
Lafayette.....	72	22	47.0	3.03	T.	Rockport.....	93	31	57.7	1.61	1.61	Spottsville.....	70	22	46.6	2.46	2.0
Lewisburg.....	72	17	46.6	3.06	T.	Runge.....	90	32	57.6	1.35	1.35	Stanardsville.....	71	17	44.1	1.74	2.0
Lynnville.....	76	11	46.4	3.58	T.	San Antonio.....	83	16	51.7	0.00	0.00	Staunton.....	71	20	42.8	1.21	1.0
McKenzie.....	80	10	44.8	3.62	T.	Sanderson.....	85	29	52.5	1.74	1.74	Stephens City.....	77	24	48.6	3.62	T.
Maryville.....	69	16	45.5	2.97	T.	San Marcos.....	81	20	50.4	2.40	2.40	Sunbeam.....	70	20	45.5	2.08	1.5
Newport.....	75	12	43.2	2.69	T.	Sherman.....	85	25	53.2	2.62	2.62	Tobaccoville.....	67	27	44.8	2.52	4.0
Nunnally.....	74	13	46.2	3.86	T.	Temple.....	84	20	52.6	1.59	1.59	Warsaw.....	70	22	45.1	2.49	T.
Oak Hill.....	73	12	44.9	4.08	0.5	Tyler.....	82	24	54.6	3.13	3.13	Westbrook.....	71	22	45.2	...	...
Palmetto.....	77	14	47.0	2.67	T.	Victoria.....	84	26	53.8	1.27	1.27	Westpoint.....	72	20	43.8	...	...
Perry.....	74	20	46.2	3.35	T.	Waco.....	85	21	52.1	2.50	2.50	Woodstock.....	70	21	43.1	2.08	0.5
Pope.....	76	12	46.2	3.57	T.	Waxahachie.....	84	21	50.6	1.21	1.21	Wytheville.....	80	14	42.4	1.81	2.2
Rogersville.....	70	13	43.2	2.56	T.	Weatherford.....	84	21	50.6	1.21	1.21	<i>Washington.</i>					
Rugby.....	68	9	41.4	2.32	T.	Wichita Falls.....	82	24	54.6	3.13	3.13	Aberdeen.....	68	31	43.4	10.94	...
St. Joseph.....	73	13	45.1	3.31	T.	<i>Utah.</i>						Anacortes.....	...	...	...	5.74	0.5
Savannah.....	73	18	47.8	4.01	T.	Alpine.....	60	13	32.2	1.18	1.18	Ashford.....	...	...	...	10.43	4.0
Sewanee.....	69	11	44.0	4.67	T.	Blue Creek.....	77	10	39.6	1.92	1.92	Blaine.....	57	18	37.0	7.86	4.0
Silverlake.....	65	12	41.5	1.73	T.	Brigham.....	77	10	39.6	1.92	1.92	Bridgeport.....	12	...	...	T.	T.
Springdale.....	76	10	44.0	3.34	T.	Cisco.....	76	9	34.8	1.03	1.03	Brinnon.....	55	30	42.1	5.79	

TABLE II.—Meteorological record of voluntary and other cooperating observers—Continued.

Temperature. (Fahrenheit.)						Precipitation.		Temperature. (Fahrenheit.)						Precipitation.									
Maximum.		Minimum.		Mean.		Rain and melted snow.	Total depth of snow.	Maximum.		Minimum.		Mean.		Rain and melted snow.	Total depth of snow.								
Stations.		Stations.		Stations.				Stations.															
Washington—Cont'd.								Wisconsin—Cont'd.								Colorado.							
Lind.....	58	11	34.7	1.37	7.7	Knapp.....	62	-24	28.4	1.04	9.0	Rico.....	66	8	39.7	0.15	Ins.						
Loomis.....	60	14	33.4	0.34	3.0	Koepenick * ¹	72	10	37.2	2.30	6.0	<i>Illinois.</i>											
Madrone †.....	57	28	43.7	4.86	T.	Lancaster †.....	65	-7	30.3	1.51	4.5	Cordova.....	76	26	50.4	4.25							
Mayfield.....	64	30	42.4	10.81	0.5	Lincoln.....	63	5	35.0	0.70	1.0	<i>Kansas.</i>											
Moxee Valley †.....	66	18	37.6	0.53	1.8	Madison †.....	63	1	33.3	0.55	2.0	Fallriver.....		26		2.49	T.						
New Whatcom.....	57	26	43.8	4.08	0.8	Manitowoc †.....	58	5	34.8	0.65	2.5	Fort Scott.....	89	28	55.0	2.53	T.						
Oiga.....	56	31	42.2	4.31		Meadow Valley †.....	65	-10	31.3	1.32	6.0	Gove * ¹	89	27	52.4	1.80	3.0						
Olympia †.....	58	29	45.0	6.84		Medford †.....	63	-12	28.4	2.45	8.5	Hoxie.....	84	19	46.9	0.05	0.5						
Oreca Island.....	55	31	43.8	3.65		Menasha.....				0.77	4.0	Lebanon.....	86	15	49.7	0.60							
Pinehill †.....	59	24	39.1	4.34	1.8	Neillsville.....	60	-8	30.6	1.30	2.0	<i>Maryland.</i>											
Pomeroy.....	56	24	38.2	3.43	11.0	New London.....	65	-3	32.6	1.06	2.5	Pocomoke City.....	90	34	64.2	4.39							
Port Townsend.....	58	35	46.1	1.57	T.	North Crandon.....	60	-5	31.2	1.25	6.5	<i>Nebraska.</i>											
Pullman †.....	53	18	33.4	1.85	12.0	Oconto.....	67	3	34.6	1.95	2.5	Albion.....	80	15	47.0	0.51	3.0						
Rosalia †.....	53	12	33.0	2.52	12.3	Osceola †.....	59	-34	26.4	1.69	17.0	Edgar.....				0.90							
Sedro †.....	58	28	42.5	8.88	2.5	Oshkosh.....	65	-2	33.8	1.75	3.5	Elba.....				1.05							
Shoalwater Bay * ¹⁰	55	35	46.2			Peppin.....	60	-22	28.1	1.45	9.0	Lincoln †.....	84	25	48.8	0.72	T.						
Silvania.....	53	28	41.0	6.52		Pine River †.....	66	-5	33.2	1.11	4.7	Republican * ¹	68	26	44.3								
Snohomish †.....	56	29	43.4	4.63	T.	Portage †.....	66	-1	31.8	0.93	2.0	Schuyler.....				1.86	2.0						
Snoqualmie Falls.....				7.33		Port Washington.....	68	1	35.6	1.37	2.0	Springview.....	89	13	47.2								
Southbend.....	58	31	44.6	11.79		Prairie du Chien.....	70	-37	36.2	1.52	5.0	<i>Nevada.</i>											
Stampede.....	48	22	33.0	10.74	53.8	Prentice * ¹	55	-4	26.1	2.43	5.6	Elko (near).....	60	8	37.7	0.90	5.0						
Sunnyside †.....	62	17	38.2	0.41	1.0	Racine.....	67	5	36.4	1.29		McGill.....	74	13	43.6	T.	T.						
Tunnel.....	42	20	33.8			Sharon.....	65	-2	31.6	0.92	T.	<i>New Mexico.</i>											
Union City †.....	55	30	43.0	10.95	3.5	Shawano.....	64	0	32.5	1.23	2.0	Winsors Ranch.....	71	7	41.2	1.10							
Vancouver.....	57	29	44.2	5.48		Sheboygan * ¹⁰	67	10	36.0			<i>North Dakota.</i>											
Waterville.....	55	8	28.7	1.55	15.5	Spooner.....	58	-26	29.5	1.30	12.0	Ellendale.....	70	18	49.2	1.10	2.0						
<i>West Virginia.</i>						Stevens Point †.....	64	-8	31.0	1.15	4.0	<i>Ohio.</i>											
Beckley *.....				1.36	2.0	Sturgeon Bay Canal * ¹⁰	55	-8	34.4			Shenandoah.....	89	25	51.8	4.09							
Beverly †.....	78	-3	39.6	4.74	15.0	Two Rivers * ¹⁰	55	9	36.7			Van Wert.....	90	29	53.9	2.76							
Bluefield.....	70	10	41.0	3.02	3.0	Valley Junction †.....	64	-12	31.2	1.69	6.2	<i>South Dakota.</i>											
Buckhannon †.....				3.79	0.7	Viroqua.....	62	-5	31.4	1.81	7.5	Mellette.....	82	17	41.2	1.35	6.0						
Buckhannon †.....	69	0	40.4			Watertown.....	65	-2	32.4	1.33	5.0	Nowlin.....	86	8	45.7	T.	T.						
Burlington †.....	70	12	39.6	1.95	4.0	Waukesha †.....	63	-2	34.2	0.98	4.0	<i>Tennessee.</i>											
Charleston †.....				3.64	T.	Waupaca.....	65	-5	32.2	1.11	4.2	Arlington.....	90	27	59.3	3.86							
Dayton †.....	73	3	40.4	2.59	3.8	Wausau †.....	62	0	31.8	2.13	6.5	Brownsville.....	88	30	61.0	5.08							
Eastbank.....	72	18	44.0	1.00	1.0	Wausaukee.....	64	5	34.1	1.10	2.0	Covington.....	93	32	60.3	0.98							
Elkhorn †.....	70	13	43.4	2.84	2.6	Westfield †.....	66	-4	32.1	1.01	3.0	Dyersburg.....	87	31	59.6	4.02							
Fairmont †.....				2.66	3.0	Westpark.....	66	5	35.0	1.22	2.6	Milan.....	87	28	59.4	7.07							
Glenview †.....	70	11	41.0	3.03	2.0	Whitehall.....	62	-10	31.4	1.55	7.0	<i>Texas.</i>											
Grafton †.....	74	7	42.8	3.34	6.9	<i>Wyoming.</i>						Fort Clark.....	98	49	76.0	0.56							
Green Sulphur.....	69	10	41.9	1.21	2.0	Basin.....	62	-10	27.8	0.20	2.0	Golindo.....				1.45							
Harpers Ferry.....				3.60	4.5	Big Horn Ranch.....	57	-19	25.4	0.47	7.0	<i>West Virginia.</i>											
Hinton †.....				2.32	2.0	Big Piney.....				0.60	6.0	Marlinton.....	81	19	52.2	4.54							
Hinton †.....	71	15	42.2		1.0	Carbon.....	63	-6	27.6	0.48	8.6												
Huntington.....	73	15	41.6	2.60		Evansville.....	63	-6	26.8	2.10	21.0												
Kingwood.....	71	4	39.8	3.39	6.5	Fort Laramie.....	76	-5	30.2	0.55	4.5												
Marlinton.....				3.85	3.5	Fort Washakie.....	63	-10	29.4	0.03	0.3												
Martinsburg †.....	66	20	41.9	2.91	5.0	Fort Yellowstone.....	52	-13	25.0	1.55	14.5												
Morgantown †.....	79	9	42.2	2.67	2.0	Laramie.....	61	-12	23.8	0.61	6.1												
New Cumberland.....	73	10	41.8	2.89	3.5	Lovell.....	54	-20	25.4	0.17	0.4												
New Martinsville.....	76	14	42.7	3.22	3.0	Lusk.....	61	-13	25.4	0.57	5.3												
Nuttallburg.....	72	9	39.9	2.10	3.0	Rawlins.....	58	-4	29.8	1.60	16.0												
Oldfields †.....	69	10	39.8	2.30	5.0	Sheridan.....	68	-12	31.0	0.43	3.0												
Phillips †.....	73	5	41.1	3.80	6.7	Thayne.....	58	-9	26.4														
Phillips †.....				3.32		Wamsutter.....	60	-10	33.4														
Point Pleasant †.....	74	15	42.8	2.67	T.	Wheatland.....	73	2	33.2	0.76	7.0												
Powellton.....	70	14	41.8	3.41	1.0	<i>Mexico.</i>																	
Romney.....	69	19	41.1	2.07	1.8	Ciudad P. Diaz.....	83	36	78.2	1.75													
Rowlesburg †.....				2.52	11.0	Leon de Aldamas.....	77	33	60.9	1.14													
Upper Tract.....	74	11	42.4	2.16	4.0	Puebla.....	77	34	57.7	3.48													
Weston †.....				3.50		Topolobampo.....				0.50													
Weston †.....	70	8	41.3		4.0	<i>New Brunswick.</i>																	
Wheeling †.....				2.66	2.7	St. John.....	57	19	38.3	5.78	5.2												
Wheeling †.....	70	13	43.7	2.45	2.5	<i>Puerto Rico.</i>																	
<i>Wisconsin.</i>						Guayama * ¹	81	69	73.5														
Amherst.....	65	-5	32.3	1.70	6.0	Luquillo.....	87	65	76.4	16.83													
Barron.....				1.00	6.0	Ponce * ¹	84	70	76.3														
Bayfield.....	59	-6	30.2	1.40	12.0	Rio Piedras.....	80	68	76.4														
Beloit.....	64	2	33.8	1.60	4.2																		
Brodhead.....	68	-4	34.2	1.17	7.0																		
Chilton.....	65	0	34.8	0.38	2.2																		
Citypoint.....	65	-5	31.2	2.30	4.5																		
Delavan.....	65	-5	32.4	1.11	3.5																		
Dodgeville.....				1.88	7.0																		
Easton.....	67	-13	32.9	1.74	5.6																		
Eau Claire.....	63	-12	30.2	1.79	9.5																		
Florence †.....	63	0	30.5	1.12	3.5																		
Fond du Lac.....	61	-2	33.8	1.29	2.8																		
Grand River Locks.....				1.12	4.0																		
Grantsburg †.....	60	-32	30.2	1.80	18.0																		
Gratiot.....	66	-4	31.3	1.65	1.5																		
Hartford.....	66	-3	33.4	1.77	3.5																		
Harvey.....	64	0	32.6	1.24	6.2																		
Hayward.....	64	-21	30.2	1.70	14.0																		
Heafford Junction * ¹	55	0	29.2	2.28	12.0																		
Hillsboro.....	69	-8	32.0	1.1																			

TABLE III.—Data furnished by the Canadian Meteorological Service, November, 1898.

Stations.	Pressure.			Temperature.				Precipitation.			Stations.	Pressure.			Temperature.				Precipitation.		
	Mean not reduced.	Mean reduced.	Departure from normal.	Mean.	Departure from normal.	Mean max. min.	Mean min. max.	Total.	Departure from normal.	Depth of snow.		Mean not reduced.	Mean reduced.	Departure from normal.	Mean.	Departure from normal.	Mean max. min.	Mean min. max.	Total.	Departure from normal.	Depth of snow.
St. Johns, N. F.	29.84	30.00	+0.07	40.5	+4.0	46.2	34.8	8.18	.....	1.0	Saugeen, Ont.	29.29	30.03	+0.01	36.6	+1.6	42.6	30.5	2.12	-1.78	14.0
Sydney, C. B. I.	29.91	29.95	-0.01	42.2	+5.1	49.6	34.7	9.37	+3.76	0.0	Parry Sound, Ont.	29.30	30.01	-0.01	34.8	+2.7	41.8	27.8	3.63	-0.58	12.7
Halifax, N. S.	29.84	29.97	-0.03	43.4	+6.1	50.3	36.5	10.25	+5.03	3.7	Port Arthur, Ont.	29.16	29.89	-0.12	28.1	+4.1	36.6	19.6	0.77	-1.21	1.2
Grand Manan, N. B.	29.90	29.95	-0.08	39.7	+1.8	44.8	34.5	10.05	+5.82	13.9	Winnipeg, Man.	29.07	29.93	-0.12	19.4	+1.4	28.1	10.6	2.00	+1.01	19.0
Yarmouth, N. S.	29.87	29.95	-0.09	41.5	+0.6	47.7	35.4	8.44	+5.50	7.0	Minneapolis, Minn.	28.06	29.97	-0.07	17.9	+0.6	27.4	8.4	1.05	+0.25	9.0
Charlottetown, P. E. I.	29.88	29.90	-0.02	40.4	+4.9	45.3	35.5	5.66	+1.93	4.5	Qu'Appelle, Assin.	27.57	29.95	-0.08	17.4	+1.4	25.4	9.4	1.44	+0.84	14.2
Chatham, N. B.	29.94	29.96	-0.02	35.6	+4.6	41.3	29.8	4.34	+0.02	17.6	Medicine Hat, Assin.	27.54	29.93	-0.11	23.2	+4.2	33.3	13.2	1.23	-0.90	12.0
Father Point, Que.	29.95	29.98	+0.02	30.8	+1.9	37.2	24.3	2.76	+0.30	15.1	Swift Current, Assin.	27.29	29.99	-0.07	22.0	+1.2	30.0	14.0	0.41	-0.10	4.0
Quebec, Que.	29.91	29.95	-0.01	31.0	+2.0	36.3	25.8	1.61	-2.41	11.6	Calgary, Alberta	26.25	29.93	-0.11	21.7	+4.1	31.3	12.1	0.80	-0.05	3.0
Montreal, Que.	29.81	30.03	+0.01	34.0	+2.2	40.1	27.9	2.15	-1.02	15.7	Banff, Alberta	25.20	30.02	-0.09	20.9	.....	27.9	13.8	0.94	.....	9.4
Rockliffe, Ont.	29.49	30.02	-0.02	31.9	+3.3	40.1	23.8	1.42	-1.23	1.2	Edmonton, Alberta	27.49	29.89	-0.13	22.6	+0.3	31.4	13.7	0.53	+0.31	4.4
Ottawa, Ont.	29.71	30.04	.....	32.7	+1.0	40.2	25.2	1.43	.....	10.7	Prince Albert, Sask.	28.26	29.86	.....	16.6	+1.2	24.6	8.5	0.90	.....	9.0
Kingston, Ont.	29.72	30.04	.....	32.7	+1.0	40.2	25.2	1.43	.....	10.7	Battleford, Sask.	28.12	29.96	.....	16.4	+2.7	24.2	8.5	0.68	.....	6.7
Toronto, Ont.	29.66	30.06	+0.01	36.1	+0.5	43.6	28.5	3.01	+0.06	14.1	Kamloops, B. C.	28.65	29.97	.....	32.6	.....	37.8	27.4	1.44	.....	9.5
White River, Ont.	29.56	29.96	-0.08	24.9	+4.4	33.9	15.9	2.02	+0.13	9.9	Esquimalt, B. C.	29.94	29.97	.....	43.5	+1.9	47.6	39.4	4.44	.....	0.0
Port Stanley, Ont.	29.40	30.06	+0.01	36.8	0.0	44.0	29.5	3.43	+0.28	9.0	Hamilton, Bermuda.	29.92	30.08	+0.03	67.9	+0.8	72.5	63.3	5.31	.....	0.0

TABLE IV.—Mean temperature for each hour of seventy-fifth meridian time, November, 1898.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midn't.	Mean.
Bismarck, N. Dak.	21.0	20.3	19.8	19.3	19.1	18.3	17.7	17.4	16.7	17.6	20.3	24.0	27.5	29.7	31.3	31.9	31.8	30.7	28.3	26.1	24.6	23.1	22.3	20.6	23.3
Boston, Mass.	39.9	39.6	39.0	38.9	38.6	38.4	38.4	39.3	40.5	41.9	43.4	45.0	45.5	45.8	45.6	45.1	44.6	44.3	43.3	42.5	41.9	41.4	40.8	40.3	41.8
Buffalo, N. Y.	37.9	37.5	37.5	37.6	37.6	37.8	37.8	37.9	38.7	39.7	41.1	42.2	43.2	43.4	43.3	42.9	42.0	41.3	40.7	39.8	39.2	39.0	38.3	38.1	39.8
Chicago, Ill.	35.7	34.8	34.2	33.5	32.8	32.4	31.9	32.3	32.6	33.5	34.9	36.6	37.8	38.8	39.7	40.6	40.7	40.1	39.0	38.2	37.6	37.2	36.6	36.1	36.2
Cincinnati, Ohio	41.6	41.4	41.1	40.8	39.9	39.0	38.4	38.4	39.0	39.7	41.9	43.8	44.8	45.9	46.5	46.9	46.2	45.6	44.7	43.8	43.2	42.7	42.2	41.7	42.5
Cleveland, Ohio	41.1	41.8	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7
Detroit, Mich.	36.5	36.1	35.6	35.4	35.4	35.1	34.9	34.9	35.6	36.7	37.7	38.5	39.5	40.6	41.0	41.1	40.2	39.6	38.9	38.1	37.6	37.3	36.7	36.4	37.5
Dodge, Kans.	35.3	34.1	33.2	32.4	31.5	30.9	29.9	29.4	29.1	29.4	30.7	31.7	32.4	33.2	34.0	34.9	35.7	36.5	37.3	38.1	38.8	39.0	39.4	39.8	40.2
Eastport, Me.	37.5	38.5	38.1	38.0	37.5	37.3	37.8	37.8	38.8	39.6	40.1	41.7	42.6	43.6	44.2	44.3	43.9	43.2	42.4	41.5	40.8	40.3	39.8	39.3	40.2
Galveston, Tex.	26.0	25.0	25.5	26.4	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5
Havre, Mont.	38.3	37.4	36.9	35.7	35.0	34.8	34.2	34.0	34.7	35.2	36.4	37.2	37.8	38.3	38.7	39.1	39.5	39.9	40.3	40.7	41.1	41.5	41.9	42.3	42.7
Kansas City, Mo.	73.8	73.6	73.5	73.5	73.1	73.1	73.1	73.9	75.1	76.2	77.3	78.0	77.9	77.7	77.2	76.8	76.0	74.9	74.5	74.4	74.3	74.0	73.9	73.9	75.0
Key West, Fla.	46.6	45.9	45.2	44.7	43.9	43.5	43.6	43.6	44.5	46.4	48.9	51.2	53.2	54.7	56.1	55.8	55.5	54.3	52.9	52.1	50.2	49.4	48.2	47.5	49.1
Memphis, Tenn.	50.9	50.9	50.3	50.2	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9	49.9
Mt. Tamalpais, Cal.	55.3	54.4	54.1	53.4	52.8	52.4	52.2	52.4	53.1	54.8	56.9	58.9	60.5	61.2	62.2	62.3	62.5	61.7	60.7	59.3	57.7	57.0	56.6	56.2	57.0
New Orleans, La.	43.0	42.4	41.9	41.7	40.9	40.8	40.8	42.7	43.6	45.0	45.9	46.7	47.2	47.6	47.7	47.9	47.4	46.9	46.4	45.8	45.1	44.4	43.6	43.1	44.5
New York, N. Y.	42.3	41.9	41.3	40.7	40.4	40.2	40.3	41.5	42.5	43.9	45.7	47.1	48.4	49.4	49.7	49.3	48.4	47.1	46.5	45.5	44.5	43.7	43.4	42.6	44.4
Philadelphia, Pa.	40.0	39.5	39.2	39.3	39.1	38.7	39.0	39.6	40.3	42.0	43.7	45.5	47.0	48.1	48.3	47.6	47.0	46.5	45.7	44.2	43.4	42.2	41.4	40.7	42.6
Pittsburg, Pa.	43.0	42.7	42.3	41.9	41.7	41.5	41.3	41.0	41.0	41.0	42.4	44.0	45.9	48.5	49.1	49.1	48.7	47.7	47.0	46.5	45.7	44.2	43.3	42.3	44.3
Portland, Oreg.	41.4	40.6	39.8	39.1	38.2	38.0	37.8	37.9	38.7	40.1	42.4	44.0	45.9	48.5	49.1	49.1	48.7	47.7	47.0	46.5	45.7	44.2	43.3	42.3	44.3
St. Louis, Mo.	28.5	28.0	27.4	27.1	26.7	26.4	25.9	25.4	25.2	25.9	27.9	30.0	32.1	33.3	34.1	34.9	35.5	35.4	34.5	33.0	31.6	30.2	28.7	28.0	29.6
St. Paul, Minn.	35.5	34.8	33.6	33.4	32.2	32.0	31.6	32.7	31.1	31.5	34.1	37.6	40.3	41.8	43.1	44.0	43.8	43.7	42.3	40.8	39.6	38.7	37.6	36.4	37.2
Salt Lake City, Utah	56.8	56.2	55.8	55.4	54.5	54.3	53.9	53.6	53.4	53.8	56.0	60.4	63.6	64.9	65.6	65.8	65.6	64.5	62.6	61.2	59.8	58.5	57.6	56.9	59.1
San Diego, Cal.	53.5	53.2	52.3	51.8	51.4	50.8	50.6	51.2	50.5	50.2	50.4	51.8	53.6	55.4	57.2	58.6	59.9	60.1	59.2	57.4	55.7	53.5	51.0	48.4	54.2
San Francisco, Cal.	54.1	53.6	53.0	52.3	51.8	51.1	51.0	51.6	54.5	57.6	60.1	62.2	63.4	64.0	63.9	63.1	61.1	58.2	57.4	56.4	55.7	55.0	54.1	53.4	56.9
Savannah, Ga.	40.0	39.6	39.2	38.9	38.9	38.7	38.7	39.8	42.1	44.4	46.3	48.0	49.6	50.5	51.0	50.9	50.0	48.2	46.4	44.9	43.6	42.9	41.6	40.6	44.0
Washington, D. C.	76.2	76.1	75.9	75.7	75.7	76.1	77.1	79.2	80.3	81.1	81.2	81.5	81.1	81.0	79.8	79.0	78.0	77.4	77.3	77.2	77.3	77.3	76.8	76.2	78.1
Basseterre, St. Kitts	75.7	75.2	74.8	74.3	73.8	73.7	74.3	76.8	79.5	81.0	82.1	82.9	82.9	83.1	82.2	81.4	80.3	79.3	78.3	77.9	77.2	76.9	76.5	76.3	78.2
Colon, U. S. C.	77.2	77.1	76.9	77.0	77.2	77.6	79.7	80.7	81.2	81.6	82.7	83.2	83.5	83.0	82.2	80.9	79.5	79.3	79.0	78.9	78.6	78.3	78.3	77.9	79.6
Willemstad, Curaçao	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

TABLE V.—Mean pressure for each hour of seventy-fifth meridian time, November, 1898.

Bismarck, N. Dak....	28.185	.186	.183	.184	.181	.178	.177	.174	.176	.179	.181	.180	.174	.162	.151	.144	.149	.161	.171	.179	.187	.189	.187	.189	.175		
Boston, Mass.....	29.860	.860	.859	.857	.862	.870	.880	.885	.884	.882	.871	.856	.845	.841	.840	.846	.850	.856	.868	.860	.861	.859	.858	.852	.861		
Buffalo, N. Y.....	29.205	.200	.211	.206	.205	.206	.215	.218	.219	.218	.213	.197	.180	.168	.168	.170	.176	.182	.187	.186	.184	.183	.186	.190	.195		
Chicago, Ill.....	29.135	.139	.143	.146	.146	.152	.156	.163	.169	.168	.165	.155	.138	.122	.116	.118	.121	.124	.133	.134	.133	.130	.129	.128	.140		
Cincinnati, Ohio....	29.459	.454	.452	.447	.444	.445	.451	.463	.474	.483	.484	.470	.453	.439	.432	.430	.441	.438	.445	.451	.449	.452	.452	.451	.452		
Cleveland, Ohio.....	29.242	.243	.242	.241	.242	.241	.245	.250	.253	.254	.248	.232	.216	.206	.205	.206	.206	.212	.221	.226	.226	.227	.225	.230	.230		
Detroit, Mich.....	29.272	.270	.270	.267	.262	.262	.265	.274	.280	.280	.278	.268	.253	.243	.237	.239	.242	.246	.251	.254	.256	.257	.260	.260	.260		
Dodge, Kans.....	27.401	.404	.400	.405	.404	.402	.408	.414	.422	.428	.420	.414	.404	.378	.362	.349	.345	.348	.355	.374	.381	.389	.395	.403	.392		
Eastport, Me.....	29.859	.860	.859	.860	.863	.870	.876	.881	.880	.877	.862	.851	.838	.835	.836	.837	.841	.844	.846	.844	.844	.842	.838	.837	.853		
Galveston, Tex.....	30.065	.062	.058	.057	.058	.063	.072	.075	.090	.099	.100	.093	.068	.046	.024	.017	.014	.018	.026	.034	.052	.055	.054	.057	.057		
Havre, Mont.....	27.249	.252	.250	.253	.249	.247	.246	.246	.249	.255	.261	.264	.261	.249	.238	.232	.231	.236	.238	.242	.245	.245	.247	.247	.247		
Kansas City, Mo....	29.054	.052	.050	.048	.045	.045	.046	.050	.059	.067	.069	.066	.056	.039	.028	.025	.025	.027	.033	.042	.049	.051	.053	.054	.047		
Key West, Fla.....	29.034	.027	.019	.015	.015	.022	.034	.057	.065	.072	.065	.050	.032	.014	.003	.009	.001	.006	.015	.038	.040	.042	.042	.040	.031		
Memphis, Tenn.....	29.739	.736	.738	.738	.735	.737	.742	.749	.759	.765	.766	.758	.730	.706	.692	.680	.680	.690	.694	.704	.713	.721	.726	.729	.727		
Mt. Tamalpais, Cal.	27.631	.628	.629	.622	.621	.614	.612	.614	.618	.629	.641	.651	.657	.654	.638	.626	.616	.610	.604	.605	.610	.618	.621	.627	.625		
New Orleans, La....	30.098	.095	.096	.095	.098	.101	.107	.114	.128	.138	.138	.131	.109	.082	.065	.057	.058	.060	.067	.072	.084	.092	.095	.093	.095		
New York, N. Y.....	29.709	.710	.708	.708	.712	.717	.731	.739	.740	.738	.724	.708	.694	.687	.690	.694	.699	.702	.707	.708	.711	.711	.706	.699	.710		
Philadelphia, Pa....	29.960	.965	.963	.960	.960	.966	.975	.963	.994	.995	.988	.967	.949	.936	.935	.938	.942	.946	.946	.948	.952	.951	.948	.947	.959		
Pittsburg, Pa.....	29.190	.191	.191	.189	.193	.191	.196	.212	.209	.209	.202	.183	.167	.159	.157	.152	.156	.155	.165	.162	.166	.170	.173	.179	.179		
Portland, Oreg.....	29.935	.934	.929	.926	.925	.924	.914	.911	.909	.910	.916	.928	.939	.939	.931	.923	.916	.916	.920	.918	.922	.925	.930	.932	.924		
St. Louis, Mo.....	29.494	.494	.498	.496	.501	.501	.504	.512	.518	.522	.522	.510	.492	.470	.459	.459	.461	.465	.474	.477	.480	.484	.489	.489	.489		
St. Paul, Minn.....	29.052	.050	.050	.053	.047	.047	.046	.046	.052	.056	.059	.059	.046	.033	.023	.022	.027	.032	.037	.044	.048	.047	.053	.056	.045		
Salt Lake City, Utah.	25.674	.680	.680	.684	.690	.686	.691	.685	.702	.712	.716	.723	.714	.696	.678	.666	.658	.656	.634	.658	.659	.661	.665	.668	.682		
San Diego, Cal.....	29.917	.917	.919	.915	.911	.906	.904	.904	.911	.924	.936	.943	.940	.931	.905	.885	.874	.871	.868	.872	.882	.894	.902	.912	.906		
San Francisco, Cal..	29.960	.963	.963	.962	.962	.959	.956	.957	.962	.971	.984	.992	.000	.992	.972	.953	.941	.934	.929	.927	.936	.943	.951	.959	.960		
Savannah, Ga.....	30.067	.064	.065	.067	.071	.080	.091	.098	.106	.108	.098	.078	.057	.042	.037	.037	.042	.045	.050	.053	.059	.064	.066	.066	.067		
Washington, D. C....	30.007	.013	.011	.011	.015	.019	.028	.039	.047	.047	.038	.018	.052	.076	.072	.073	.074	.081	.087	.090	.094	.096	.094	.096	.005		
West Indies.																											
Basseterre, St. Kitts.	29.875	.867	.861	.850	.862	.888	.902	.914	.919	.913	.906	.890	.870	.858	.855	.857	.864	.874	.884	.891	.897	.897	.896	.891	.883		
Bridgetown, Bar....	29.884	.875	.874	.877	.891	.908	.925	.937	.943	.939	.924	.900	.881	.872	.873	.875	.887	.898	.912	.921	.924	.923	.916	.905	.903		
Colon, U. S. C.....	29.855	.841	.829	.826	.829	.838	.862	.871	.888	.890	.878	.860	.830	.811	.792	.789	.800	.808	.823	.836	.855	.864	.867	.866	.842		
Roseau, Dominica...	29.896	.888	.887	.889	.902	.918	.934	.941	.946	.940	.919	.900	.883	.877	.876	.881	.889	.899	.910	.918	.925	.927	.921	.915	.907		
Willemsd, Curaçao	29.812	.801	.795	.797	.812	.827	.850	.864	.874	.868	.846	.819	.793	.775	.766	.766	.772	.785	.807	.828	.843	.845	.842	.831	.817		

TABLE VI.—Average wind movement for each hour of seventy-fifth meridian time, November, 1898.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex.	10.8	10.2	9.5	9.4	8.7	9.7	9.9	9.2	9.1	9.5	11.6	12.4	13.1	13.1	13.5	14.0	13.5	12.9	11.3	9.4	9.1	10.0	10.2	10.0	10.8
Albany, N. Y.	7.3	7.4	7.6	6.9	6.9	6.5	6.9	7.3	7.8	8.9	9.3	9.8	10.3	9.9	10.2	9.6	8.6	7.9	7.3	7.3	8.2	8.5	7.4	7.8	8.1
Alpena, Mich.	10.7	10.4	10.8	11.0	10.4	10.2	10.2	10.0	10.4	10.6	11.1	11.6	12.9	13.0	13.0	12.5	12.1	11.0	11.3	11.5	12.0	11.6	11.2	10.5	11.3
Amarillo, Tex.	17.6	17.4	17.2	17.3	16.1	16.6	16.1	16.7	17.0	15.8	17.7	19.5	21.2	21.6	22.0	22.1	21.2	20.4	19.1	16.0	16.0	14.5	15.7	16.3	18.0
Atlanta, Ga.	8.6	8.3	8.7	8.7	9.5	9.6	9.2	8.8	9.2	9.9	10.2	10.5	10.9	10.9	11.0	10.8	10.6	9.8	8.9	9.5	9.5	9.3	9.5	9.3	9.6
Atlantic City, N. J.	11.5	11.9	11.5	11.4	11.6	11.9	11.9	11.8	12.9	13.1	13.1	12.9	12.9	13.0	13.4	12.6	12.1	11.5	11.3	11.1	11.3	11.3	11.7	11.3	12.0
Augusta, Ga.	5.3	4.9	4.8	4.8	5.1	5.9	5.4	5.0	6.1	6.5	6.7	7.4	8.1	8.5	8.3	8.5	8.0	6.3	6.4	6.2	5.8	6.0	5.5	5.0	6.2
Baker City, Oreg.	4.8	5.2	5.4	5.3	4.9	4.9	4.3	4.8	5.2	5.0	4.3	5.0	4.4	4.3	4.2	4.3	4.8	5.5	4.2	3.8	4.0	4.2	4.5	5.1	4.7
Baltimore, Md.	4.0	4.1	4.6	4.6	4.5	4.5	4.5	4.9	5.0	5.6	5.7	6.0	6.5	6.2	6.3	6.7	5.6	4.9	4.3	4.1	3.9	3.8	4.2	4.1	4.9
Bismarck, N. Dak.	8.0	7.3	7.4	7.8	8.3	7.8	8.5	8.7	9.1	9.2	9.7	11.9	13.7	14.4	14.9	15.5	14.0	11.6	9.2	8.0	7.3	7.5	7.7	8.0	9.8
Block Island, R. I.	18.9	18.7	18.9	19.0	18.8	18.2	19.2	19.8	18.6	19.0	18.5	17.6	18.7	17.8	17.2	16.6	16.8	17.1	17.2	17.0	17.7	18.0	18.8	18.7	18.2
Boston, Mass.	12.5	11.8	11.8	12.2	12.4	12.2	12.4	12.5	12.8	13.5	13.3	13.7	13.2	13.5	13.3	13.2	12.4	11.9	11.6	11.2	11.4	11.8	12.2	12.4	12.5
Buffalo, N. Y.	16.1	16.8	16.8	16.1	17.0	16.2	16.1	16.1	16.5	16.6	17.1	17.8	17.8	16.9	16.8	16.0	16.6	15.3	15.6	16.5	16.2	16.0	17.2	17.0	16.5
Calro, Ill.	9.2	9.0	9.1	8.8	8.8	8.5	8.5	9.1	9.3	10.3	11.2	11.3	11.5	11.7	11.3	11.1	10.8	8.9	7.7	7.7	7.9	8.3	9.2	9.5	9.5
Cape Henry, Va.	16.0	16.2	15.8	15.7	16.0	17.2	16.7	16.0	16.2	17.0	17.1	16.9	16.5	15.5	15.2	15.6	14.6	13.9	14.9	15.5	16.0	16.0	16.2	15.7	15.9
Carson City, Nev.	6.6	6.5	6.2	5.9	5.6	4.8	5.2	4.5	3.4	3.6	3.9	4.1	6.8	7.1	8.1	8.8	10.1	9.9	10.3	8.3	6.7	7.2	6.3	5.9	6.5
Charleston, S. C.	10.4	10.9	11.2	11.6	11.7	12.0	12.3	12.1	12.2	11.6	12.5	12.7	12.6	12.7	12.4	12.7	11.9	10.2	10.0	9.7	9.8	10.4	10.7	10.3	11.5
Charlotte, N. C.	5.8	6.0	5.7	5.8	6.1	5.5	6.0	6.1	6.4	7.7	8.2	8.6	8.6	8.5	8.7	8.1	7.3	6.1	6.1	6.3	6.5	6.0	6.1	6.1	6.8
Chattanooga, Tenn.	6.5	6.7	7.2	7.2	7.2	7.0	6.7	6.7	7.3	8.3	9.8	10.1	10.4	10.9	11.2	10.2	10.3	8.6	7.3	6.9	6.8	7.0	7.0	6.6	8.1
Cheyenne, Wyo.	10.9	9.4	9.5	9.2	9.5	10.1	10.6	10.2	10.2	10.5	11.5	13.0	14.7	15.1	15.6	15.4	15.0	13.8	12.2	10.0	10.3	9.9	9.9	10.2	11.5
Chicago, Ill.	20.6	18.9	18.7	19.2	19.4	19.4	20.2	20.5	21.7	21.9	22.5	22.7	24.6	23.9	24.1	23.0	22.9	20.4	20.8	21.2	21.1	20.9	20.2	19.3	21.2
Cincinnati, Ohio.	6.8	5.7	5.8	5.7	6.0	7.0	6.9	7.4	8.3	9.3	9.9	10.7	11.3	11.1	10.8	10.7	10.3	9.4	8.9	8.1	8.1	7.8	7.1	7.0	8.3
Cleveland, Ohio.	19.0	18.7	18.4	17.7	17.5	16.9	16.8	16.5	16.8	17.1	16.5	16.4	16.4	16.3	16.1	16.1	16.1	16.3	16.8	17.1	17.6	17.9	19.3	19.3	17.2
Columbia, Mo.	9.9	9.4	8.5	8.0	8.3	8.4	8.6	8.6	9.3	9.8	10.9	11.3	11.6	11.6	11.8	11.4	10.7	9.7	8.7	8.7	9.2	9.8	10.0	9.8	9.8
Columbus, Ohio.	7.5	7.1	7.1	6.9	7.0	7.1	7.0	7.4	8.2	9.3	9.8	9.9	10.7	10.8	10.6	10.3	9.0	8.1	8.1	8.4	8.4	8.2	7.6	7.0	8.4
Concordia, Kans.	7.1	6.9	6.8	7.8	6.9	6.8	6.8	7.1	6.8	7.2	8.6	9.8	10.3	11.0	10.5	10.9	10.3	9.1	7.0	6.4	6.3	6.7	7.1	6.8	8.0
Corpus Christi, Tex.	10.1	9.8	9.2	9.8	10.2	10.1	10.1	9.9	9.6	10.1	10.4	11.3	11.5	12.0	11.8	12.1	12.3	11.7	11.4	11.1	10.4	10.4	10.3	10.3	10.7
Davenport, Iowa.	7.7	7.9	7.9	7.4	7.4	7.6	8.0	8.3	8.8	9.3	10.6	11.8	12.6	12.1	11.8	11.2	9.9	8.0	7.3	7.7	8.2	7.9	7.8	7.2	8.9
Denver, Colo.	8.9	8.3	7.9	7.9	6.4	6.8	7.5	7.4	7.3	7.6	7.6	8.1	9.3	9.5	10.4	9.8	10.1	9.5	8.8	7.9	8.5	6.8	6.9	7.8	8.2
Des Moines, Iowa	7.5	7.6	7.3	7.6	7.3	7.6	7.4	8.0	7.3	8.4	9.5	10.9	11.4	11.7	11.9	11.4	10.1	8.3	7.6	7.4	7.9	7.9	7.5	7.1	8.6
Detroit, Mich.	10.9	11.1	11.3	11.2	10.8	10.8	10.7	10.5	10.8	11.5	12.1	12.1	12.9	13.1	13.0	12.8	12.0	11.1	11.0	11.4	11.6	11.9	11.7	10.9	11.6
Dodge, Kans.	12.1	12.1	11.6	11.8	11.1	10.7	10.3	10.1	9.7	11.2	12.9	14.9	16.3	15.9	16.1	15.6	14.8	12.4	9.2	8.3	8.9	9.8	10.8	11.1	12.0
Dubuque, Iowa.	7.4	8.0	7.7	7.3	7.3	7.6	8.0	8.4	8.3	9.8	10.2	10.4	11.5	11.8	11.5	10.6	9.2	7.3	7.2	7.3	7.2	6.9	7.6	6.8	8.6
Duluth, Minn.	11.5	12.2	12.8	12.6	11.8	10.9	11.0	11.1	9.9	9.4	11.0	11.9	12.2	12.0	12.2	12.3	11.4	10.7	11.0	11.7	11.3	11.9	11.7	11.2	11.5
Eastport, Me.	14.9	13.9	14.0	14.1	13.9	13.7	13.7	14.0	15.1	15.8	15.9	15.6	15.3	15.5	15.1	14.1	13.8	13.9	13.9	13.9	13.7	14.2	15.1	15.1	14.5
El Paso, Tex.	11.4	11.8	11.7	11.0	10.9	11.2	10.4	10.0	9.9	9.4	9.7	11.5	13.6	14.2	15.1	16.0	15.9	15.4	13.9	11.5	10.1	10.3	10.4	11.4	11.9
Erie, Pa.	13.3	14.1	14.3	15.2	15.3	15.1	14.4	14.2	14.8	14.6	14.3	14.0	12.8	12.6	12.2	11.2	10.9	11.3	12.1	12.5	12.6	13.5	14.0	14.2	13.5
Escanaba, Mich.	9.6	10.0	9.5	9.6	9.1	9.0	9.3	10.3	10.7	11.1	11.8	11.9	12.7	13.0	13.2	12.6	11.4	10.8	11.3	10.7	10.2	10.2	10.3	9.5	10.7
Eureka, Cal.	3.7	3.0	3.2	3.0	3.0	3.3	3.0	2.8	2.9	3.0	3.2	2.9	3.4	4.5	5.1	6.8	7.3	9.0	9.5	7.9	6.9	6.1	5.3	5.9	4.7
Evansville, Ind.	7.7	7.6	7.2	7.5	7.8	7.4	7.2	7.6	8.2	9.4	9.7	10.6	10.6	10.2	10.4	9.3	8.9	7.7	6.8	6.7	6.7	6.6	7.6	7.7	8.2
Fort Canby, Wash.	14.1	13.6	14.4	15.5	14.6	14.0	14.5	13.9	14.0	13.4	12.9	12.7	13.5	13.2	13.0	13.0	13.5	12.5	13.2	12.8	12.1	13.0	14.9	15.0	13.6
Fort Smith, Ark.	6.6	6.6	6.5	6.6	7.0	6.8	6.8	6.9	6.5	7.2	7.6	7.8	7.9	8.5	8.9	9.2	8.9	7.9	6.5	7.0	6.5	6.3	6.0	6.1	7.2
Fresno, Cal.	3.8	3.4	3.8	3.3	3.1	3.5	3.6	3.4	3.6	3.7	3.2	3.3	3.6	4.0	4.0	4.1	3.9	3.8	3.6	3.0	2.9	2.9	3.1	3.1	3.5
Galveston, Tex.	10.6	10.6	10.4	10.6	11.2	11.7	11.4	11.8	11.5	11.6	11.7	11.6	12.0	11.7	11.7	10.8	11.0	10.4	10.5	11.0	10.7	10.3	10.3	10.4	11.1
Grand Haven, Mich.	13.0	13.2	13.4	13.1	12.9	12.6	12.7	12.6	12.9	13.3	13.7	14.6	14.3	14.4	14.8	14.0	13.5	13.4	12.8	13.2	13.0	13.2	13.6	12.5	13.4
Green Bay, Wis.	8.6	8.8	8.6	8.4	8.4	8.6	8.6	8.4	8.6	9.8	11.0	11.9	11.9	11.9	12.2	10.7	9.6	8.6	8.2	9.0	9.0	8.3	8.4	8.4	9.4
Hannibal, Mo.	9.5	8.5	8.4	9.0	9.0	9.8	9.7	9.3	10.4	11.3	12.3	12.8	13.8	13.8	12.8	12.4	11.1	9.6	8.9	9.6	9.9	10.4	10.4	10.3	10.5
Harrisburg, Pa.	7.9	7.6	7.8	8.5	8.5	8.2	8.4	8.5	8.7	9.7	9.8	9.9	10.1	10.4	10.3	9.8	8.4	7.7	7.9	8.3	7.3	7.4	8.1	7.5	8.6
Hatteras, N. C.	15.8	16.4	16.3	16.3	15.5	15.8	16.2	16.3	15.9	15.4	14.6	15.1	15.6	15.0	14.1	14.6	14.5	14.6	14.2	15.2	15.4	15.7	15.6	15.6	15.4
Hayre, Mont.	12.1	12.3	12.4	12.2	12.9	13.7	12.0	12.3	12.8	12.0	12.3	12.5	14.9	17.0	17.1	16.9	15.9	13.3	11.5	10.6	9.9	10.5	11.4	11.2	12.9
Helena, Mont.	9.5	9.2	7.8	7.7	7.7	8.4	9.0	7.5	7.4	7.2	6.4	6.9	9.0	8.3	8.4	8.4	7.4	7.6	7.0	7.3	7.7	7.5	8.2	9.2	7.9
Huron, S. Dak.	12.6	12.8	11.9	11.5	11.3	11.6	10.9	11.1	10.9	11.4	13.9	14.5	15.2	16.2	16.3	16.5	16.1	14.2	11.9	12.0	12.8	11.9	11.7	12.4	12.9
Idaho Falls, Idaho	9.1	9.8	10.0	9.3	8.4	9.3	9.2	9.5	8.9	8.6	8.5</														

TABLE VI.—Average wind movement, etc.—Continued.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
North Platte, Nebr....	7.7	7.8	7.6	7.7	7.3	7.8	7.7	7.8	7.6	7.2	8.8	10.3	12.0	13.1	14.0	13.9	13.0	11.5	8.8	7.9	8.1	8.3	7.6	7.7	9.2
Oklahoma, Okla.....	10.5	11.1	10.5	10.0	10.4	10.4	10.2	10.8	10.4	12.0	11.7	14.4	14.6	15.4	15.4	15.1	14.4	12.7	10.5	10.0	10.2	9.8	10.0	10.3	11.8
Omaha, Nebr.....	8.5	8.2	7.9	7.6	7.4	7.5	7.4	7.6	7.4	7.8	9.3	10.2	9.7	10.2	10.1	10.5	10.0	9.0	7.8	7.8	7.9	8.4	8.6	9.0	8.6
Oswego, N. Y.....	12.7	13.7	13.4	13.6	13.8	13.5	13.3	13.3	13.5	13.3	13.6	13.8	14.0	13.8	13.0	12.8	12.8	12.7	13.2	13.1	13.2	12.6	12.4	13.2	13.3
Palestine, Tex.....	6.6	6.8	6.7	6.9	6.9	6.7	6.9	6.8	6.7	7.5	8.2	9.1	10.1	9.5	9.2	9.3	9.1	8.1	6.6	5.8	6.1	6.7	6.8	7.0	7.5
Parkersburg, W. Va....	5.8	5.5	5.4	4.9	5.0	4.6	5.0	4.7	4.7	5.8	6.9	8.2	8.9	8.4	8.9	8.2	7.3	6.0	5.8	5.5	5.7	5.6	6.1	5.9	6.2
Pensacola, Fla.....	9.4	10.0	9.4	9.5	10.0	10.5	10.6	10.9	12.4	12.8	12.9	12.6	11.4	10.7	11.2	11.0	10.4	9.3	8.8	8.6	8.9	9.1	9.7	9.3	10.4
Philadelphia, Pa.....	9.4	9.0	9.2	8.5	8.7	8.6	9.1	9.7	10.0	11.4	11.7	11.6	12.4	12.7	11.8	10.8	10.2	9.8	9.9	9.8	9.0	9.8	10.4	10.2	10.2
Phoenix, Ariz.....	3.2	3.1	3.2	3.4	3.4	3.3	3.0	3.2	3.4	3.4	3.7	4.8	5.2	5.1	4.9	4.6	4.7	4.6	3.7	3.0	2.9	2.8	2.5	2.9	3.7
Pierre, S. Dak.....	9.7	9.5	8.9	9.0	9.5	8.8	9.1	9.7	9.6	10.1	12.4	13.0	14.8	15.4	16.2	15.6	14.7	13.2	10.2	9.9	9.4	9.1	9.6	9.2	11.1
Pittsburg, Pa.....	5.9	5.8	5.5	5.6	5.3	5.4	5.5	5.7	6.4	6.8	6.9	7.5	7.6	7.7	7.7	7.5	7.0	6.8	6.5	6.3	6.3	6.0	6.5	6.4	6.4
Point Reyes Lt., Cal..	17.9	17.6	17.2	17.3	17.5	17.9	17.6	18.1	16.6	16.3	16.3	15.2	13.6	13.5	13.9	14.3	15.2	16.7	18.1	19.0	19.5	19.6	19.7	19.0	17.0
Port Huron, Mich.....	12.0	11.8	12.0	11.4	11.6	11.7	11.4	11.7	12.3	12.5	13.2	12.8	13.3	14.0	14.3	13.9	13.5	12.8	13.1	13.8	13.9	14.5	14.0	12.6	12.8
Port Crescent, Wash..	3.1	3.7	4.0	3.9	3.7	3.4	4.0	4.0	3.6	3.6	3.6	3.4	3.9	4.7	5.5	5.4	5.6	4.7	4.1	3.6	3.2	2.9	3.7	3.8	4.0
Portland, Me.....	7.9	8.2	7.9	7.6	7.3	8.1	8.1	8.4	8.9	9.0	8.7	8.6	9.5	9.8	9.3	8.7	8.2	8.5	8.2	8.7	8.7	8.1	8.2	8.2	8.4
Portland, Oreg.....	9.2	9.4	10.0	10.3	9.9	9.4	9.3	9.9	9.9	9.0	9.1	9.7	9.5	10.1	10.5	10.1	10.3	10.0	8.8	8.0	8.0	9.0	9.5	9.4	9.5
Pueblo, Colo.....	6.9	6.4	6.0	6.1	6.4	6.3	7.0	6.2	6.3	6.5	6.3	6.4	7.8	7.9	8.8	10.3	10.4	10.4	9.0	7.4	7.0	7.2	6.3	6.3	7.3
Raleigh, N. C.....	6.1	6.3	5.9	5.7	5.8	5.7	5.7	5.6	6.5	7.1	7.7	7.4	7.7	7.3	7.4	7.1	6.6	6.1	5.9	6.0	5.9	5.8	5.7	5.8	5.4
Rapid City, S. Dak...	7.0	6.9	6.7	7.1	6.9	7.7	7.8	7.4	7.1	6.7	7.0	7.3	8.8	10.3	11.2	11.8	11.3	9.7	8.3	6.5	6.2	6.1	6.1	6.1	7.8
Red Bluff, Cal.....	6.4	6.0	6.2	6.1	6.0	5.9	5.9	6.1	5.7	5.3	5.1	5.6	6.5	7.3	7.9	8.4	8.4	8.3	7.8	6.5	6.6	7.1	6.5	6.1	6.6
Richmond, Va.....	5.0	5.4	5.2	5.1	5.1	4.9	5.1	5.3	5.6	7.3	7.0	7.4	7.8	7.4	6.8	6.5	6.2	5.5	5.2	5.3	5.2	5.3	5.1	4.9	5.8
Rochester, N. Y.....	8.0	7.3	8.1	8.0	8.0	7.7	8.0	8.0	9.0	9.4	9.9	10.1	10.3	10.1	10.3	9.3	8.5	7.5	7.0	7.0	7.6	7.3	7.0	7.6	8.4
Roseburg, Oreg.....	2.3	1.8	2.2	2.2	2.6	2.4	2.5	2.3	2.3	3.0	2.7	3.0	3.5	3.9	4.1	4.7	4.6	4.7	4.0	3.2	3.1	2.4	2.7	2.6	3.0
Sacramento, Cal.....	7.9	8.6	8.6	9.3	8.7	8.4	8.1	8.0	8.0	7.7	7.1	6.6	7.4	8.0	8.6	8.9	8.5	7.9	7.1	7.4	8.0	7.9	7.5	7.5	8.0
St. Louis, Mo.....	10.5	10.9	10.2	10.3	10.0	9.8	9.6	10.4	11.0	11.4	12.0	12.5	12.8	12.9	12.8	12.1	10.5	10.3	11.0	11.6	11.6	10.9	10.2	11.2	11.2
St. Paul, Minn.....	8.1	8.4	8.5	8.2	8.1	8.3	7.9	8.8	8.4	8.6	8.8	9.4	10.2	10.7	11.1	10.8	10.4	9.7	9.3	8.8	8.5	8.2	8.0	8.1	9.0
Salt Lake City, Utah..	4.3	4.6	4.2	3.5	3.6	4.5	4.1	3.9	4.2	4.4	4.3	4.4	5.1	6.9	7.3	8.0	7.7	7.0	6.1	4.9	4.5	4.8	5.2	5.1	5.1
San Antonio, Tex.....	8.9	8.2	7.8	7.2	7.4	7.1	7.2	7.2	7.5	8.2	8.4	9.4	10.2	11.9	11.6	11.8	12.2	11.7	10.9	10.5	9.0	8.8	10.1	10.0	9.7
San Diego, Cal.....	3.7	4.3	4.4	4.0	4.4	4.5	4.8	4.6	4.6	4.9	3.4	3.8	5.0	6.3	8.0	9.4	10.2	9.4	8.2	6.8	4.5	3.4	4.1	3.8	5.4
Sandusky, Ohio.....	9.1	9.2	8.6	8.4	8.4	8.5	8.3	7.6	8.4	9.8	9.8	10.1	10.1	10.0	10.0	9.2	8.6	7.2	8.2	8.8	9.3	9.9	9.8	9.6	9.0
San Francisco, Cal....	6.3	5.1	5.2	4.9	5.5	5.8	5.9	5.7	5.5	5.5	5.8	6.5	7.6	7.0	7.1	7.5	9.9	10.9	11.8	12.7	11.2	9.2	7.7	7.0	7.4
San Luis Obispo, Cal..	3.3	3.7	3.6	3.9	4.1	4.8	4.7	4.7	4.7	4.5	4.3	4.1	5.4	6.5	7.0	7.3	7.3	7.4	6.9	5.4	5.1	4.1	3.5	3.4	5.0
Santa Fe, N. Mex.....	5.9	5.8	5.4	5.5	4.9	5.0	4.3	4.5	4.6	4.2	5.1	7.5	9.1	9.5	9.9	10.3	10.4	9.9	7.9	4.9	5.7	6.0	6.3	6.2	6.6
Sault Ste. Marie, Mich	8.8	8.9	8.6	9.5	9.8	9.3	9.3	9.4	9.0	8.9	9.5	10.1	10.0	10.4	10.9	10.8	10.1	9.4	9.5	10.1	10.0	9.8	9.4	8.9	9.6
Savannah, Ga.....	8.2	7.9	7.7	7.7	7.1	6.9	7.5	7.4	8.7	10.1	10.5	10.5	11.2	11.0	11.4	10.8	10.4	8.0	7.5	7.7	8.2	8.6	8.5	8.3	8.8
Seattle, Wash.....	8.3	7.7	8.2	7.4	7.4	7.0	7.0	7.2	6.9	6.3	6.4	6.2	7.1	7.0	7.0	7.3	7.9	8.4	7.6	7.2	6.9	7.0	7.5	8.0	7.3
Shreveport, La.....	7.5	7.2	7.3	7.3	7.3	7.2	7.2	6.8	6.8	7.7	7.8	7.8	8.6	8.6	9.0	9.3	9.3	8.4	7.4	7.1	7.7	7.7	7.7	7.5	7.8
Sioux City, Iowa.....	14.1	14.7	13.7	13.3	13.6	12.6	12.3	12.4	11.6	12.3	13.1	14.8	16.1	17.0	17.4	17.8	17.9	15.2	14.1	13.5	13.5	13.8	13.5	13.6	14.3
Spokane, Wash.....	5.2	4.4	5.6	6.2	6.2	6.2	6.3	6.0	6.5	6.4	6.3	6.5	6.7	6.8	7.3	7.8	7.1	7.6	6.7	6.2	6.2	5.8	5.6	5.6	6.3
Springfield, Ill.....	10.5	10.7	10.0	9.5	9.3	9.1	10.0	9.9	10.6	12.0	12.9	13.0	13.5	13.7	13.2	12.6	11.3	9.8	9.5	9.7	9.8	10.0	9.8	9.7	10.8
Springfield, Mo.....	11.6	11.3	11.9	11.9	12.0	12.0	12.1	12.3	11.9	12.4	13.2	13.5	13.8	14.2	14.3	13.7	12.1	10.8	10.3	11.0	11.4	10.7	11.0	12.2	12.2
Tacoma, Wash.....	7.2	6.7	6.2	6.4	5.9	6.0	6.2	6.8	6.5	6.3	6.7	7.2	8.0	8.2	9.0	9.1	8.3	8.5	8.0	7.7	7.2	6.8	6.8	7.2	7.2
Tampa, Fla.....	5.6	5.6	5.5	5.0	4.9	4.7	5.1	5.5	7.0	8.2	8.8	9.2	9.8	9.4	8.8	8.8	8.1	6.7	5.7	5.8	5.6	5.3	5.4	5.3	6.7
Toledo, Ohio.....	10.7	11.0	11.4	10.8	11.0	10.8	10.4	10.0	10.9	12.6	13.0	13.2	13.5	13.7	13.8	12.6	11.8	10.8	10.8	11.4	11.3	11.1	10.3	10.7	11.6
Vicksburg, Miss.....	7.5	7.0	7.0	7.7	7.3	7.3	7.4	7.1	7.1	7.5	7.3	7.3	7.6	7.3	7.8	7.5	7.0	5.8	5.4	5.8	6.4	6.6	7.1	7.1	7.0
Vineyard Haven, Mass..	10.8	10.5	10.6	10.2	10.1	10.6	11.3	11.1	11.8	12.1	11.6	11.1	11.9	11.2	10.9	9.9	10.1	10.6	10.3	10.2	9.9	10.2	10.7	10.7	10.8
Walla Walla, Wash....	5.1	5.4	5.5	5.2	5.1	5.5	5.1	5.2	5.1	5.4	5.8	6.0	6.3	6.3	7.1	7.6	7.2	7.1	7.0	6.0	5.7	6.0	5.8	5.2	5.9
Washington, D. C.....	5.8	5.7	5.5	5.7	5.3	6.2	6.1	6.2	7.3	9.1	9.7	10.2	10.5	10.0	9.6	8.7	7.4	6.2	6.3	5.7	5.6	6.2	6.2	6.2	7.2
Wichita, Kans.....	9.1	9.7	9.8	9.4	9.7	10.0	10.1	10.1	9.9	10.5	11.8	13.0	13.1	13.5	13.6	12.8	12.1	10.2	7.7	7.8	8.6	9.0	9.0	8.6	10.4
Williston, N. Dak.....	8.0	7.5	7.2	7.6	7.0	7.0	7.4	7.4	7.1	6.3	8.4	9.7	11.5	11.5	12.1	12.6	11.8	10.5	9.5	8.9	7.6	6.5	7.1	6.3	8.6
Wilmington, N. C.....	7.8	8.0	8.0	7.9	7.5	8.2	8.3	8.4	9.4	9.6	10.5	10.1	9.6	9.8	10.5	10.2	8.9	7.0	6.7	7.2	7.9	7.5	7.4	8.5	8.5
Winnemucca, Nev.....	8.9	9.8	9.5	9.0	8.7	9.4	8.4	9.0	9.3	8.6	9.4	8.8	10.2	10.1	10.1	11.4	12.1	12.7	11.7	10.8	9.8	8.7	8.0	8.3	9.7
Woods Hole, Mass.....	18.5	17.8	17.4	17.8	17.4	17.5	17.7	18.4	18.0	19.0	18.2	18.3	17.8	17.8	17.5	18.0	18.2	18.1	17.0	17.1	17.0	17.1	18.8	18.8	17.9
Yankton, S. Dak.....	9.5	9.6	9.6	9.6	9.2	8.3	8.5	8.																	

TABLE VII.—Resultant winds from observations at 8 a. m. and 8 p. m., daily, during the month of November, 1898.

Stations.	Component direction from—				Resultant.		Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.		N.	S.	E.	W.	Direction from—	Duration.
<i>New England.</i>							<i>North Dakota.—Continued.</i>						
Eastport, Me.	26	11	13	22	n. 31 w.	18	Bismarck, N. Dak.	25	12	14	28	n. 47 w.	19
Portland, Me.	24	12	5	30	n. 64 w.	28	Williston, N. Dak.	24	20	10	22	n. 41 w.	18
Northfield, Vt.	25	30	3	9	s. 50 w.	8	<i>Upper Mississippi Valley.</i>						
Boston, Mass.	21	11	7	33	n. 69 w.	28	St. Paul, Minn.	16	23	16	24	s. 49 w.	11
Nantucket, Mass.	26	10	11	26	n. 43 w.	22	La Crosse, Wis.	8	16	5	9	s. 27 w.	9
Woods Hole, Mass.*	9	8	6	14	n. 83 w.	8	Davenport, Iowa	9	21	15	29	s. 49 w.	18
Block Island, R. I.	26	9	11	29	n. 47 w.	25	Des Moines, Iowa	19	21	4	27	s. 85 w.	23
New Haven, Conn.	33	7	8	25	n. 33 w.	31	Dubuque, Iowa	12	28	12	20	s. 27 w.	18
<i>Middle Atlantic States.</i>							Keokuk, Iowa	13	25	13	25	s. 45 w.	17
Albany, N. Y.	25	22	5	16	n. 75 w.	11	Cairo, Ill.	20	22	17	15	s. 45 e.	3
Binghamton, N. Y.†	12	2	12	11	n. 6 e.	11	Springfield, Ill.	12	28	7	22	s. 43 w.	22
New York, N. Y.	25	13	13	28	n. 51 w.	19	Hannibal, Mo.†	6	11	8	13	s. 45 w.	7
Harrisburg, Pa.†	9	3	7	15	n. 53 w.	10	St. Louis, Mo.	9	24	15	21	s. 22 w.	16
Philadelphia, Pa.	24	15	10	26	n. 61 w.	18	<i>Missouri Valley.</i>						
Atlantic City, N. J.	25	13	10	29	n. 58 w.	22	Columbia, Mo.*	4	11	8	12	s. 30 w.	8
Cape May, N. J.	22	15	9	27	n. 69 w.	19	Kansas City, Mo.	15	25	21	18	s. 17 e.	10
Baltimore, Md.	14	13	13	25	n. 47 w.	16	Springfield, Mo.	13	17	28	12	s. 76 e.	16
Washington, D. C.	22	17	8	24	n. 73 w.	17	Lincoln, Nebr.	10	31	12	14	s. 5 w.	21
Lynchburg, Va.	23	18	5	32	n. 80 w.	28	Omaha, Nebr.	18	24	8	24	s. 69 w.	17
Norfolk, Va.	25	16	14	17	n. 18 w.	10	Sioux City, Iowa†	10	12	5	10	s. 68 w.	5
Richmond, Va.	14	23	10	21	s. 51 w.	14	Pierre, S. Dak.	24	16	20	23	n. 21 w.	8
<i>South Atlantic States.</i>							Huron, S. Dak.	19	19	12	23	w.	11
Charlotte, N. C.	28	15	21	8	n. 45 e.	18	Yankton, S. Dak.†	9	7	3	19	n. 87 w.	16
Hatteras, N. C.	32	9	6	24	n. 38 w.	29	<i>Northern Slope.</i>						
Raleigh, N. C.	23	16	14	19	n. 36 w.	9	Havre, Mont.	13	18	9	36	s. 80 w.	28
Wilmington, N. C.	28	8	21	13	n. 22 e.	22	Miles City, Mont.	13	23	6	30	s. 67 w.	26
Charleston, S. C.	34	6	19	12	n. 14 e.	29	Helena, Mont.	11	26	1	37	s. 68 w.	39
Augusta, Ga.	27	6	19	22	n. 8 e.	21	Rapid City, S. Dak.	19	9	8	36	n. 70 w.	30
Savannah, Ga.	33	11	19	14	n. 13 e.	23	Cheyenne, Wyo.	26	9	3	35	n. 62 w.	36
Jacksonville, Fla.	29	10	25	12	n. 34 e.	23	Lander, Wyo.	14	24	14	24	s. 45 w.	14
<i>Florida Peninsula.</i>							North Platte, Nebr.	26	15	10	22	n. 47 w.	16
Jupiter, Fla.	15	18	24	12	s. 76 e.	12	<i>Middle Slope.</i>						
Key West, Fla.	17	9	42	3	n. 79 e.	40	Denver, Colo.	21	23	9	18	s. 77 w.	9
Tampa, Fla.	31	10	24	8	n. 37 e.	26	Pueblo, Colo.	18	10	18	22	n. 27 w.	9
<i>Eastern Gulf States.</i>							Concordia, Kans.	13	30	9	17	s. 25 w.	19
Atlanta, Ga.	26	9	26	16	n. 30 e.	20	Dodge, Kans.	16	18	16	23	s. 74 w.	7
Pensacola, Fla.	34	11	28	5	n. 45 e.	32	Wichita, Kans.	19	24	18	11	s. 54 e.	8
Mobile, Ala.	39	11	12	7	n. 10 e.	28	Oklahoma, Okla.	20	26	8	14	s. 45 w.	8
Montgomery, Ala.	21	11	29	10	n. 62 e.	22	<i>Southern Slope.</i>						
Vicksburg, Miss.	23	17	31	7	n. 76 e.	25	Amarillo, Tex.	13	29	16	18	s. 16 w.	7
New Orleans, La.	27	9	27	7	n. 48 e.	27	Abilene, Tex.	16	27	11	17	s. 29 w.	12
<i>Western Gulf States.</i>							<i>Southern Plateau.</i>						
Shreveport, La.	19	22	26	10	s. 79 e.	16	El Paso, Tex.	19	9	26	20	n. 31 e.	12
Fort Smith, Ark.	11	10	32	14	n. 87 e.	18	Santa Fe, N. Mex.	21	25	20	9	s. 70 e.	12
Little Rock, Ark.	16	23	19	17	s. 16 e.	7	Flagstaff, Ariz.	24	10	15	22	n. 27 w.	16
Corpus Christi, Tex.	31	10	20	8	n. 30 e.	24	Phoenix, Ariz.	15	13	24	20	n. 63 e.	4
Fort Worth, Tex.†	10	10	5	14	w.	9	Yuma, Ariz.	28	4	16	15	n. 2 e.	34
Galveston, Tex.	27	11	30	7	n. 55 e.	28	Independence, Cal.	28	18	9	21	n. 50 w.	16
Palestine, Tex.	25	22	20	12	n. 69 e.	8	<i>Middle Plateau.</i>						
San Antonio, Tex.	29	15	23	6	n. 51 e.	22	Carson City, Nev.	23	12	8	30	n. 47 w.	16
<i>Ohio Valley and Tennessee.</i>							Winnemucca, Nev.	19	26	7	21	s. 62 w.	15
Chattanooga, Tenn.	20	20	18	16	e.	2	Salt Lake City, Utah.	16	23	22	16	s. 41 e.	9
Knoxville, Tenn.	27	10	21	16	n. 16 e.	18	<i>Northern Plateau.</i>						
Memphis, Tenn.	19	23	17	18	s. 14 w.	4	Baker City, Oreg.	14	30	21	13	s. 27 e.	18
Nashville, Tenn.	18	23	15	15	s.	5	Idaho Falls, Idaho	14	39	3	12	s. 30 w.	27
Lexington, Ky.	11	25	13	23	s. 36 w.	17	Spokane, Wash.	11	32	10	18	s. 21 w.	22
Louisville, Ky.	14	27	17	18	s. 4 w.	13	Walla Walla, Wash.	5	39	11	13	s. 3 w.	34
Evansville, Ind.†	7	11	6	10	s. 45 w.	6	<i>North Pacific Coast Region.</i>						
Indianapolis, Ind.	16	27	5	25	s. 61 w.	23	Fort Canby, Wash.	7	10	24	19	s. 23 e.	13
Cincinnati, Ohio	7	26	20	24	s. 12 w.	19	Neah, Wash.	2	14	23	30	s. 30 w.	14
Columbus, Ohio	6	24	20	22	s. 6 w.	18	Port Crescent, Wash.	0	11	6	18	s. 47 w.	16
Pittsburg, Pa.	18	25	9	24	s. 65 w.	17	Seattle, Wash.	10	35	19	6	s. 27 e.	28
Parkersburg, W. Va.	10	30	15	19	s. 11 w.	20	Tacoma, Wash.	10	35	10	25	s. 31 w.	29
<i>Lower Lake Region.</i>							Portland, Oreg.	15	29	10	14	s. 16 w.	15
Buffalo, N. Y.	13	18	11	32	s. 77 w.	22	Roseburg, Oreg.	19	22	17	16	s. 18 e.	3
Oswego, N. Y.	16	25	18	20	s. 13 w.	9	<i>Middle Pacific Coast Region.</i>						
Rochester, N. Y.	11	23	9	34	s. 64 w.	28	Eureka, Cal.	14	26	14	21	s. 30 w.	14
Erie, Pa.	14	27	6	21	s. 49 w.	20	Mount Tamalpais, Cal.	38	4	9	28	n. 29 w.	39
Cleveland, Ohio	8	32	18	20	s. 5 w.	24	Red Bluff, Cal.	37	9	4	22	n. 33 w.	33
Sandusky, Ohio	7	25	7	30	s. 52 w.	29	Sacramento, Cal.	24	24	16	10	e.	6
Toledo, Ohio	7	26	5	34	s. 57 w.	35	San Francisco, Cal.	14	13	5	39	n. 88 w.	34
Detroit, Mich.	8	28	9	33	s. 50 w.	31	<i>South Pacific Coast Region.</i>						
<i>Upper Lake Region.</i>							Fresno, Cal.	23	12	17	21	n. 20 w.	12
Alpena, Mich.	9	27	5	29	s. 53 w.	30	Los Angeles, Cal.	17	11	5	32	n. 78 w.	28
Escanaba, Mich.	14	25	5	33	s. 68 w.	30	San Diego, Cal.	33	8	21	19	n. 5 e.	25
Grand Haven, Mich.	12	25	19	21	s. 9 w.	13	San Luis Obispo, Cal.	45	3	6	12	n. 8 w.	42
Marquette, Mich.	11	28	6	28	s. 52 w.	28	<i>West Indies.</i>						
Port Huron, Mich.	8	33	11	21	s. 22 w.	37	Basseterre, St. Kitts Island	32	2	44	1	n. 55 e.	52
Sault Ste. Marie, Mich.	13	30	23	19	s. 30 e.	8	Bridgetown, Barbados	13	5	52	0	n. 81 e.	52
Chicago, Ill.	11	27	6	29	s. 55 w.	28	Colon, U. S. C.	17	26	24	11	s. 55 e.	16
Milwaukee, Wis.	10	24	8	29	s. 56 w.	25	Rosau, Dominica	20	4	47	1	n. 71 e.	49
Green Bay, Wis.	7	29	7	35	s. 39 w.	28	Willemstad, Curaçao	11	1	56	0	n. 78 e.	48
Duluth, Minn.	22	15	7	33	n. 75 w.	27	<i>Alaska.</i>						
<i>North Dakota.</i>							Sitka	13	12	45	3	n. 89 w.	42
Moorhead, Minn.	19	20	19	22	s. 72 w.	3							

* From observations at 8 p. m. only.

† From observations at 8 a. m. only.

TABLE VIII.—Thunderstorms and auroras, November, 1898.

States.	No. of stations.																																Total.						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	No.	Days.					
Alabama.....	53	T.				3				1	1											1												6	4	T.			
Arizona.....	53	T.																			3													4	0	T.			
Arkansas.....	57	T.				3			1	1												7												12	0	T.			
California.....	189	T.				1														1														10	4	T.			
Colorado.....	73	T.																			3													10	1	T.			
Connecticut.....	22	T.																																	3	0	T.		
Delaware.....	5	T.																																	1	0	T.		
Dist. of Columbia	4	T.																																	0	0	T.		
Florida.....	45	T.																																	0	0	T.		
Georgia.....	54	T.								1										1		1												0	2	T.			
Idaho.....	27	T.																																	0	3	T.		
Illinois.....	92	T.				5	25													6	2		2											40	0	T.			
Indiana.....	55	T.				16				1																								17	1	T.			
Indian Territory.	8	T.																																	1	1	T.		
Iowa.....	126	T.				3	1																1											0	3	T.			
Kansas.....	74	T.				2																													4	0	T.		
Kentucky.....	45	T.				17														1	1													19	0	T.			
Louisiana.....	45	T.								10			3	4	1				6	2			4	1					1	1				33	10	T.			
Maine.....	17	T.																																	0	0	T.		
Maryland.....	39	T.				1		2	1												2		1	1										3	3	T.			
Massachusetts.....	54	T.				1																													2	1	T.		
Michigan.....	107	T.				2														1	1													4	0	T.			
Minnesota.....	64	T.									1	3																							4	0	T.		
Mississippi.....	42	T.				3				7									1		1		7											18	0	T.			
Missouri.....	89	T.				11	5			1	1												5											23	3	T.			
Montana.....	37	T.																			1	1							1						11	1	T.		
Nebraska.....	145	T.				1	1												1	2			1	1											0	0	T.		
Nevada.....	45	T.																																		0	0	T.	
New Hampshire.....	20	T.																																		0	0	T.	
New Jersey.....	50	T.																				2													3	0	T.		
New Mexico.....	38	T.																																		0	0	T.	
New York.....	103	T.								1																										2	2	T.	
North Carolina.....	56	T.																			1														2	3	T.		
North Dakota.....	40	T.																																		0	0	T.	
Ohio.....	124	T.				44				1																										48	3	T.	
Oklahoma.....	22	T.								1	1																									7	1	T.	
Oregon.....	71	T.								1																										13	0	T.	
Pennsylvania.....	100	T.																																			3	3	T.
Rhode Island.....	8	T.																																		1	0	T.	
South Carolina.....	44	T.																																		0	0	T.	
South Dakota.....	52	T.																																		0	0	T.	
Tennessee.....	61	T.				8				2																										16	0	T.	
Texas.....	83	T.								1	2			1	1																				7	0	T.		
Utah.....	34	T.																																		0	0	T.	
Vermont.....	14	T.																																		0	0	T.	
Virginia.....	47	T.																																		2	2	T.	
Washington.....	55	T.																																		5	0	T.	
West Virginia.....	38	T.																																		9	0	T.	
Wisconsin.....	60	T.																																		5	0	T.	
Wyoming.....	18	T.																																		12	3	T.	
Sums.....	2,804	T.				0	1	3	27	133	5	1	4	25	1	2	6	5	2	0	0	14	17	16	9	29	5	4	1	1	13	2	6	0	333	54	T.		
		A.				1	1	5	0	1	1	0	2	2	1	10	2	0	4	2	2	3	2	5	2	0	1	0	1	0	1	0	1			A.			

TABLE IX.—Average hourly sunshine (in percentages), November, 1898.

Stations.	Instrument.	Percentages for each hour of local mean time ending with the respective hour.																Hours of sunshine.			
		A. M.								P. M.								Total.			
		5	6	7	8	9	10	11	Noon	1	2	3	4	5	6	7	8	Actual.	Possible.	Percent of possible.	Personal estimate.
Albany, N. Y.	T.			9	12	24	42	51	51	49	42	39	26	21				104.9	292.3	36	26
Atlanta, Ga.	T.			51	51	58	63	70	69	69	60	52	47	37	67			179.3	312.2	57	52
Atlantic City, N. J.	P.			59	47	45	46	50	48	45	46	51	55	46				145.0	301.5	48	41
Baltimore, Md.	T.			41	39	51	58	68	79	80	74	65	45	28				177.8	301.5	59	50
Binghamton, N. Y.	T.			0	4	14	30	35	41	37	34	32	19	10				76.0	294.9	26	21
Bismarck, N. Dak.	P.			41	53	57	62	70	66	52	63	60	57	54				168.0	281.0	60	54
Boston, Mass.	T.			49	43	42	45	48	47	47	45	42	33	28				125.5	294.9	43	41
Buffalo, N. Y.	T.			5	11	27	37	51	48	54	53	37	21	15				104.4	292.3	36	31
Charleston, S. C.	T.			44	50	59	61	59	65	68	57	47	42	40	75			171.1	314.0	54	54
Chattanooga, Tenn.	T.			18	30	38	48	52	56	59	50	44	41	75				139.1	310.1	45	48
Cheyenne, Wyo.	P.			55	51	69	79	77	83	79	74	76	76	56				214.2	297.3	72	59
Chicago, Ill.	T.			23	22	41	63	66	58	57	55	52	38	40				145.0	294.9	49	44
Cincinnati, Ohio	T.			51	49	49	54	59	56	56	50	44	45	42				152.3	301.5	51	47
Cleveland, Ohio	T.			26	17	18	22	26	30	31	29	25	18	18				69.9	294.9	24	26
Columbia, Mo.	T.			58	60	66	68	74	74	76	71	60	59	55				190.6	301.5	66	48
Columbus, Ohio	T.			42	33	33	36	51	48	45	38	34	33	38				117.0	299.7	39	44
Denver, Colo.	P.			64	68	78	79	81	77	81	85	82	74	71				231.9	299.7	77	64
Des Moines, Iowa	T.			42	46	46	57	73	68	63	66	58	54	55				172.5	294.9	58	58
Detroit, Mich.	P.			11	14	32	45	41	43	50	51	39	24	14				105.3	294.9	36	31
Dodge, Kans.	T.			66	67	71	77	79	74	73	76	76	71	0				221.8	304.0	73	66
Dubuque, Iowa	T.			34	36	48	59	64	63	70	68	63	50	49				168.1	294.9	57	50
Eastport, Me.	P.			48	24	25	28	28	29	26	28	31	28	26				78.1	287.2	27	14
Erie, Pa.	T.			13	13	24	30	38	41	35	35	24	13	10				78.5	294.8	27	34
Eureka, Cal.	P.			35	30	36	41	42	42	46	46	51	51	54				124.7	297.3	42	38
Fresno, Cal.	T.			75	70	77	78	84	85	88	91	91	87	87	100			255.3	305.7	84	76
Galveston, Tex.	P.			12	35	43	54	54	52	53	50	52	50	43	26			148.9	321.7	46	40
Harrisburg, Pa.	T.			29	24	27	40	54	50	53	54	50	36	34				125.9	299.7	42	36
Helena, Mont.	P.			6	22	31	42	47	51	51	47	35	30	29				109.6	281.0	39	31
Huron, S. Dak.	T.			67	60	60	67	77	80	81	70	57	49	46				190.6	289.7	66	53
Idaho Falls, Idaho	T.			42	21	22	30	49	52	55	47	41	30	27				110.5	292.3	38	35
Indianapolis, Ind.	T.			43	43	44	50	50	53	51	48	41	32	32				133.6	299.7	45	35
Jacksonville, Fla.	T.			28	33	49	53	61	61	62	59	54	45	28	28			157.0	319.7	49	39
Kansas City, Mo.	P.			62	55	59	58	57	61	54	58	54	48	53				169.1	301.5	56	58
Key West, Fla.	T.			32	56	74	86	90	95	91	81	75	58	40	31			233.4	328.2	71	50
Knoxville, Tenn.	T.			39	34	50	60	65	68	64	62	58	48	45	100			168.8	308.3	55	47
Little Rock, Ark.	T.			38	41	56	66	75	75	73	69	68	66	62	75			198.3	310.1	64	46
Los Angeles, Cal.	P.			81	83	85	94	95	96	98	96	94	91	90	95			286.7	312.2	92	78
Louisville, Ky.	T.			53	47	47	51	48	54	53	47	43	33	30	100			138.9	304.0	46	35
Minneapolis, Minn.	T.			38	34	38	49	59	59	66	51	50	39	39				148.9	287.2	52	48
Nashville, Tenn.	T.			39	35	43	53	54	60	64	59	57	52	44	95			159.1	308.3	52	48
New Orleans, La.	T.																				38
New York, N. Y.	T.			17	33	44	46	59	64	60	60	53	41	38				147.2	297.3	50	40
Northfield, Vt.	P.			33	25	26	33	34	34	36	34	39	35	30				94.9	289.7	33	31
Oklahoma, Okla.	T.			58	61	70	71	77	77	79	75	69	57	25				217.6	310.1	70	65
Omaha, Nebr.	P.			58	44	52	64	69	68	60	66	62	56	57				177.8	297.3	60	54
Parkersburg, W. Va.	T.			12	10	14	38	45	48	49	44	32	24	21				97.2	301.5	32	32
Phoenix, Ariz.	P.			87	88	92	96	97	93	92	93	91	87	93				287.9	314.0	92	81
Philadelphia, Pa.	T.			44	39	42	46	56	59	59	62	58	54	53				157.5	299.7	53	41
Pittsburg, Pa.	T.			10	8	17	21	30	36	37	41	30	14	17				74.5	297.3	25	26
Portland, Me.	T.			0	8	33	43	45	44	44	38	40	24	16				98.4	289.7	34	33
Portland, Oreg.	T.			0	0	3	12	20	38	35	30	26	19	22				58.2	284.1	20	29
Raleigh, N. C.	T.			31	27	38	47	48	57	55	56	54	45	38	95			142.1	308.3	46	50
Rochester, N. Y.	T.			21	13	18	23	33	30	24	38	35	24	30				77.8	292.3	27	22
St. Louis, Mo.	T.			36	38	44	55	74	76	74	69	63	53	46				177.3	301.5	59	52
St. Paul, Minn.	P.			38	40	46	45	48	50	54	61	51	44	43				138.8	287.2	48	42
Salt Lake City, Utah	P.			53	45	52	63	68	70	57	59	56	51	47				169.2	297.3	57	41
San Diego, Cal.	P.			81	80	88	93	96	97	92	93	95	94	93	88			287.2	314.0	91	87
San Francisco, Cal.	T.			31	40	61	74	86	90	93	96	96	84	49	0			231.0	304.0	76	59
Santa Fe, N. Mex.	P.			64	67	71	80	88	88	89	86	87	86	88	50			253.1	308.3	82	79
Savannah, Ga.	T.			44	43	53	59	63	67	70	61	51	49	47	58			175.8	315.9	56	47
Seattle, Wash.	T.			0	4	4	10	18	22	25	23	21	11	3				41.8	278.0	15	25
Spokane, Wash.	T.			31	14	12	17	27	24	23	14	14	10	5				47.0	278.0	17	18
Tacoma, Wash.	T.			12	8	19	32	43	54	61	51	41	28	26				104.3	281.0	37	20
Tampa, Fla.	T.			30	33	40	57	62	62	63	53	50	38	31	33			154.4	323.5	48	45
Topeka, Kans.	T.			59	54	55	56	62	70	65	59	57	47	43	0			172.7	301.5	57	48
Vicksburg, Miss.	T.			35	30	40	47	47	56	53	51	53	44	34	50			142.0	315.9	45	41
Washington, D. C.	P.			49	43	49	56	60	68	67	67	60	48	37				168.1	301.5	56	49
Wilmington, N. C.	T.			44	44	51	63	73	71	71	69	64	57	36	67			185.7	312.2	59	53
Yankton, S. Dak.	T.			44	43	62	72	86	88	86	84	77	53	37				203.6	292.3	70	45
Bridgetown, Barbados	T.			0	9	31	57	62	54	40	32	18	12	7	9			111.1	346.1	32	25
Colon, United States of Columbia	T.			31	23	26	47	63	69	65	54	45	30	8	0	0		130.4	351.7	37	32
Willemstad, Curaçao	T.			40	38	82	85	85	81	87	96	98	91	81	59	31		270.0	347.6	78	48

TABLE X.—Accumulated amounts of precipitation for each 5 minutes, for storms in which the rate of fall equaled or exceeded 0.25 in any 5 minutes, or 0.75 in 1 hour during November, 1898, at all stations furnished with self-registering gauges.

Stations.	Date.	Total duration.		Total amt of precipitation.	Excessive rate.		Amount before excessive began.	Depths of precipitation (in inches) during periods of time as indicated.													
		From—	To—		Began—	Ended—		5 min.	10 min.	15 min.	20 min.	25 min.	30 min.	35 min.	40 min.	45 min.	50 min.	60 min.	80 min.	100 min.	120 min.
Albany, N. Y.	9-10			1.91														0.30			
Atlanta, Ga.	17-18			0.70														0.15			
Atlantic City, N. J.	18-19			0.79														0.30			
Baltimore, Md.	10			1.00														0.43			
Binghamton, N. Y.	9-10			1.61														0.22			
Bismarck, N. Dak. *	20-21			0.06																	
Boston, Mass.	10-11			1.30														0.15			
Buffalo, N. Y.	9-10			1.62														0.15			
Cairo, Ill.	9			0.70														0.21			
Charleston, S. C.	13-14			1.03														0.44			
Chicago, Ill. *																					
Cincinnati, Ohio	9-10			1.89														0.18			
Cleveland, Ohio	9-10			1.50														0.14			
Columbia, Mo.	20-21			0.97														0.23			
Columbus, Ohio	9-10			1.57														0.24			
Denver, Colo.	20			0.31														0.08			
Des Moines, Iowa.	21			0.82														0.31			
Detroit, Mich.	8-9			1.19														0.18			
Dodge, Kans.	21			0.35														*			
Duluth, Minn.	21-22			0.61														*			
Eastport, Me.	6			1.34														0.40			
Erie, Pa.	9-11			1.71														0.30			
Fort Worth, Tex.	20-21	10.55 p.m.	12.25 a.m.	0.78	11.00 p.m.	11.50 p.m.	0.01	0.12	0.30	0.37	0.40	0.45	0.49	0.54	0.58	0.67	0.72	0.73			
Fresno, Cal.	19			0.34														*			
Galveston, Tex.	9	1.52 p.m.	6.25 p.m.	1.62	2.14 p.m.	3.20 p.m.	0.02	0.10	0.30	0.35	0.38	0.44	0.54	0.76	0.98	1.13	1.25	1.35	1.47	1.48	
Hannibal, Mo.	4-5			0.86														0.27			
Harrisburg, Pa.	9			0.80														0.24			
Hatteras, N. C.	16			1.52														0.75			
Huron, S. Dak. *																		*			
Idaho Falls, Idaho	19-20			0.30														*			
Indianapolis, Ind.	9-10			1.15														0.18			
Jacksonville, Fla.	28-29			0.86														0.24			
Jupiter, Fla.	12			0.52														0.36			
Kansas City, Mo.	4			0.50													0.50				
Key West, Fla.	29	5.25 p.m.	8.45 p.m.	1.04	5.40 p.m.	6.05 p.m.	0.05	0.10	0.30	0.40	0.65	0.72	0.75	0.80				0.14			
Knoxville, Tenn.	18			0.65														*			
Lincoln, Nebr.	21-22			0.82														0.95	1.10		
Little Rock, Ark.	9	1.25 a.m.	12.00 m.	2.08	3.10 a.m.	4.15 a.m.	0.22	0.04	0.08	0.13	0.19	0.25	0.36	0.55	0.60	0.66	0.80				
Los Angeles, Cal.	20			T.																	
Louisville, Ky.	9-10			1.35														0.41			
Memphis, Tenn.	9			1.05														0.29			
Milwaukee, Wis.	21			0.18														0.08			
Montgomery, Ala.	9-10			1.60														0.74			
Nantucket, Mass.	18-19			0.67														0.24			
Nashville, Tenn.	9-10			1.61														0.20			
New Orleans, La.	9	6.45 p.m.	10.20 p.m.	1.13	9.03 p.m.	9.35 p.m.	0.04	0.31	0.54	0.58	0.62	0.84	1.02	1.04	1.06						
New York, N. Y.	18-19			1.60														0.16			
Norfolk, Va.	29			0.60														0.40			
Northfield, Vt.	9-11			1.27														*			
Oklahoma, Okla.	20-21			0.80														0.36			
Omaha, Nebr.	21-22			1.05														*			
Parkersburg, W. Va.	9-10			1.14														0.21			
Philadelphia, Pa.	10			1.85														0.35			
Pittsburg, Pa.	10			0.87														0.22			
Portland, Me.	10-11			1.71														0.19			
Portland, Oreg.	23			0.54														0.34			
Raleigh, N. C.	29			0.54														0.19			
Richmond, Va.	29-30			0.65														0.17			
Rochester, N. Y.	9-11			1.08														0.18			
St. Louis, Mo.	9-10			0.95														0.20			
St. Paul, Minn.	21-22			0.66														0.08			
Salt Lake City, Utah.	20			0.66														*			
San Diego, Cal.	24			0.11														*			
San Francisco, Cal.	19			0.24														0.19			
Savannah, Ga.	17-18			3.70														0.91*			
Seattle, Wash.	21			0.31														0.13			
Spokane, Wash.	18			0.29														0.05			
Tampa, Fla.	29	12.50 a.m.	2.30 a.m.	1.58	1.25 a.m.	2.15 a.m.	0.10	0.14	0.22	0.34	0.42	0.58	0.85	1.04	1.19	1.32	1.40				
Vicksburg, Miss.	9	1.40 p.m.	7.15 p.m.	1.26	2.10 p.m.	2.25 p.m.	0.10	0.29	0.58	0.62	0.64	0.67	0.71	0.76							
Do.	21	3.24 p.m.	4.15 p.m.	0.65	3.34 p.m.	4.06 p.m.	T.	0.26	0.40	0.48	0.51	0.58	0.64								
Washington, D. C.	18-19			0.92														0.22			
Wilmington, N. C.	18			1.23														0.25			
Yankton, S. Dak.	20-21			0.22														*			
Baseterre, St. Kitts	5			1.00														0.49			
Bridgetown, Barbados	6	D. N.	4.10 a.m.	0.97	2.10 a.m.	2.45 a.m.	0.11	0.06	0.16	0.38	0.49	0.59	0.67	0.71	0.73	0.74	0.77	0.81			
Do.	10	4.00 p.m.	7.38 p.m.	1.99	4.57 p.m.	5.35 p.m.	0.01	0.39	0.78	1.09	1.22	1.40	1.54	1.65	1.72	1.75	1.78	1.79			
Do.	11	11.25 a.m.	12.34 p.m.	1.01	11.40 a.m.	12.10 p.m.	0.02	0.14	0.24	0.43	0.73	0.88	0.93	0.96							
Colon, U. S. C.	19	12.30 a.m.	11.00 a.m.	2.55	3.24 a.m.	4.20 a.m.	0.08	0.08	0.13	0.27	0.48	0.73	0.88	0.97	0.98	1.00	1.16	1.25	1.36	1.61	1.67
Do.	21	4.30 a.m.	8.02 a.m.	1.51	5.35 a.m.	6.35 a.m.	0.31	0.12	0.24	0.37	0.45	0.47	0.49	0.55	0.64	0.73	0.84	1.00			
Roseau, Dominica	8-10			2.19														0.52			
Willemstad, Curacao.	7-8	11.25 p.m.	3.00 a.m.	0.88	12.54 a.m.	1.04 a.m.	0.06	0.32	0.62	0.65	0.70	0.73									
Do.	8	7.00 a.m.	11.13 a.m.	1.16	7.14 a.m.	7.31 a.m.	0.03	0.25	0.53	0.62	0.65	0.66	0.67	0.70	0.71	0.78	0.95	1.00	1.04		

* Record incomplete on account of snow or other causes.

TABLE XI.—Excessive precipitation, by stations, for November, 1898.

Stations.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
<i>Alabama.</i>						
Healing Springs		2.55	17			
Newton		2.85	14			
Union Springs		2.65	17-18			
<i>Alaska.</i>						
Sitka	13.47	3.92	12-13			
<i>Arkansas.</i>						
Amity		2.71	9			
Blanchard Springs		2.90	9			
Brinkley		2.60	9			
Camden		2.65	8			
Elon		4.22	9			
Lonoke		3.25	9			
Luna Landing		4.15	9			
Malvern		3.41	9			
Warren		2.65	9			
Washington		2.80	9			
Wiggs				2.30	2 00	9
<i>California.</i>						
Bear Valley		2.50	19			
Bowmans Dam		3.63	29			
Laporte		3.39	29			
Malakoff Mine		2.77	19			
<i>Florida.</i>				1.50	1 00	29
<i>Georgia.</i>						
Fleming		2.50	17			
Hawkinsville		2.80	17			
Jesup		3.94	17-18			
Poulan		2.53	18			
Savannah		4.15	17-18			
<i>Indiana.</i>						
Vincennes		2.50	6			
<i>Kentucky.</i>				1.00	1 00	5
Caddo						
Hopkinsville		2.70	9			
<i>Louisiana.</i>						
Amite	10.89					
Bastrop		3.84	9			
Donaldsonville		3.00	17			
Farmerville		4.20	9			
Lake Providence		2.55	9			
New Orleans				1.09	0 50	9
Paincourtville		2.54	17-18			
Plain Dealing		4.13	9			
Rayne		2.85	10			
Robeline		2.50	8-9			
Ruston		3.12	9			
<i>Maine.</i>						
Bar Harbor		2.75	10-11			
Orono		2.50	10			
<i>Massachusetts.</i>						
Chestnut Hill		2.76	26-27			
Jefferson		2.60	26-27			
Vineyard Haven	11.01	3.60	26-27			
<i>Mississippi.</i>						
Briers		4.25	13			
Brookhaven		2.60	13			
Fayette				1.13	0 25	21
Greenville		2.92	9			

TABLE XI.—Excessive precipitation—Continued.

Stations.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
<i>Missouri.</i>						
Halfway		2.75	21			
Sarcozie		2.60	21			
Springfield				1.00	0 55	21
<i>New York.</i>						
Easton		2.96	11			
<i>Ohio.</i>						
Levering		3.00	5			
<i>Oregon.</i>						
Astoria	10.93					
Bandon	12.25	3.02	29			
Bay City	16.42	2.50	30			
Cascade Locks	16.75					
Fairview	14.13					
Falls City	12.26					
Gardiner	15.00	3.72	18			
Glenora	19.09					
Government Camp	19.83	2.87	18			
Langlois	16.56	6.20	17-18			
Do		2.57	30			
Monroe	11.13					
Nehalem	15.13					
Newport	11.29					
Toledo	11.15	2.50	18			
<i>South Carolina.</i>						
Port Royal		2.73	17			
<i>Tennessee.</i>						
Johnsonville		2.63	9-10			
Perryear		2.70	9			
<i>Texas.</i>						
Alvin				1.50	1 00	9
Beaumont				2.00	1 00	24
Brazoria		2.64	9			
Burnet		2.80	9			
Columbia		2.55	10			
Fruitland		3.34	21			
Galveston				1.35	1 00	9
Grapevine				1.58	1 00	21
Houston		2.85	10			
<i>Vermont.</i>						
Jacksonville		2.65	10-11			
<i>Washington.</i>						
Aberdeen	10.94					
Ashford	10.43					
Cedar Lake	15.18					
Clearwater	15.32					
Mayfield	10.81					
Neah	15.60					
Southbend	11.79					
Stampede	10.74					
Union City	10.95					
<i>West Indies.</i>						
Bridgetown		3.01	10-11	1.64	0 33	10
Do				1.00	0 53	11
Colon	12.50	2.55	19	1.23	0 54	19
Do				1.00	1 00	21
San Juan		2.93	8-9			
Willemstad				1.00	0 55	8

Chart I. Tracks of Centers of High Areas. November, 1898.

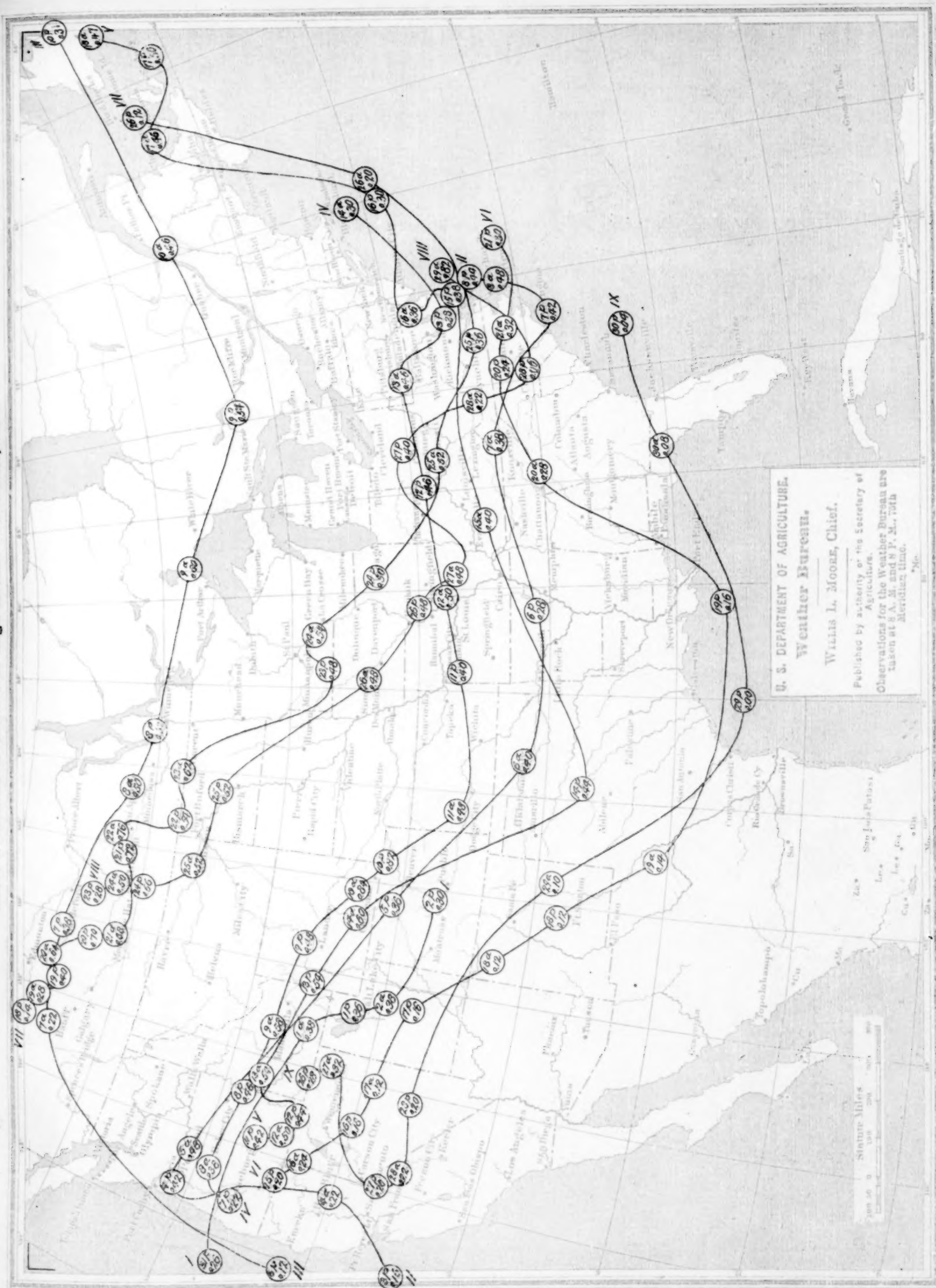
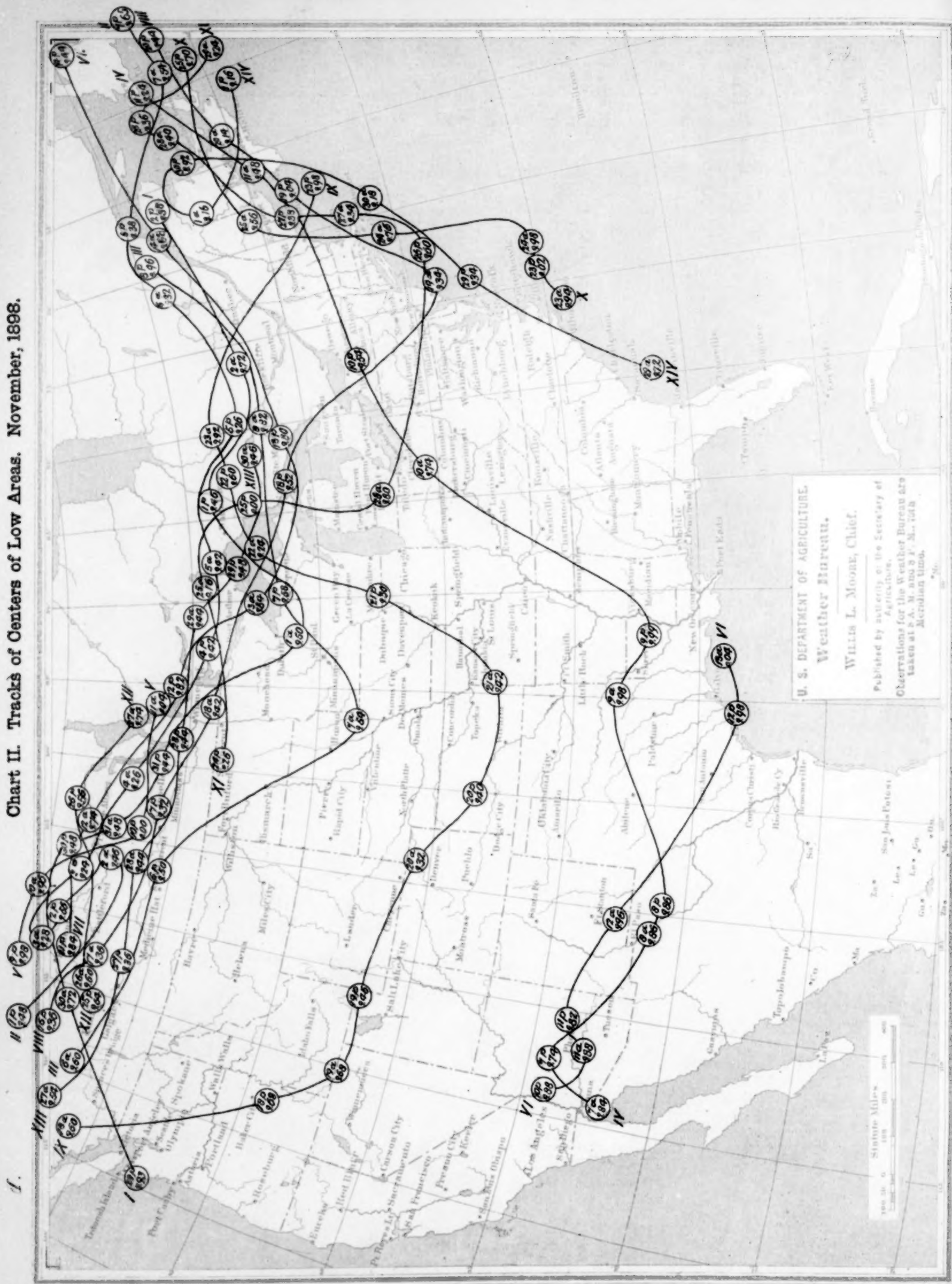


Chart II. Tracks of Centers of Low Areas. November, 1898.



U. S. DEPARTMENT OF AGRICULTURE.
Weather Bureau.
WILLIS L. MOORE, Chief.

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Observations for the Weather Bureau are taken at 8 A. M. and 8 P. M., local Meridian time.

Statute Miles
0 100 200 300 400 500

Chart III. Total Precipitation. November, 1898.

Chart III. Total Precipitation. November, 1898.

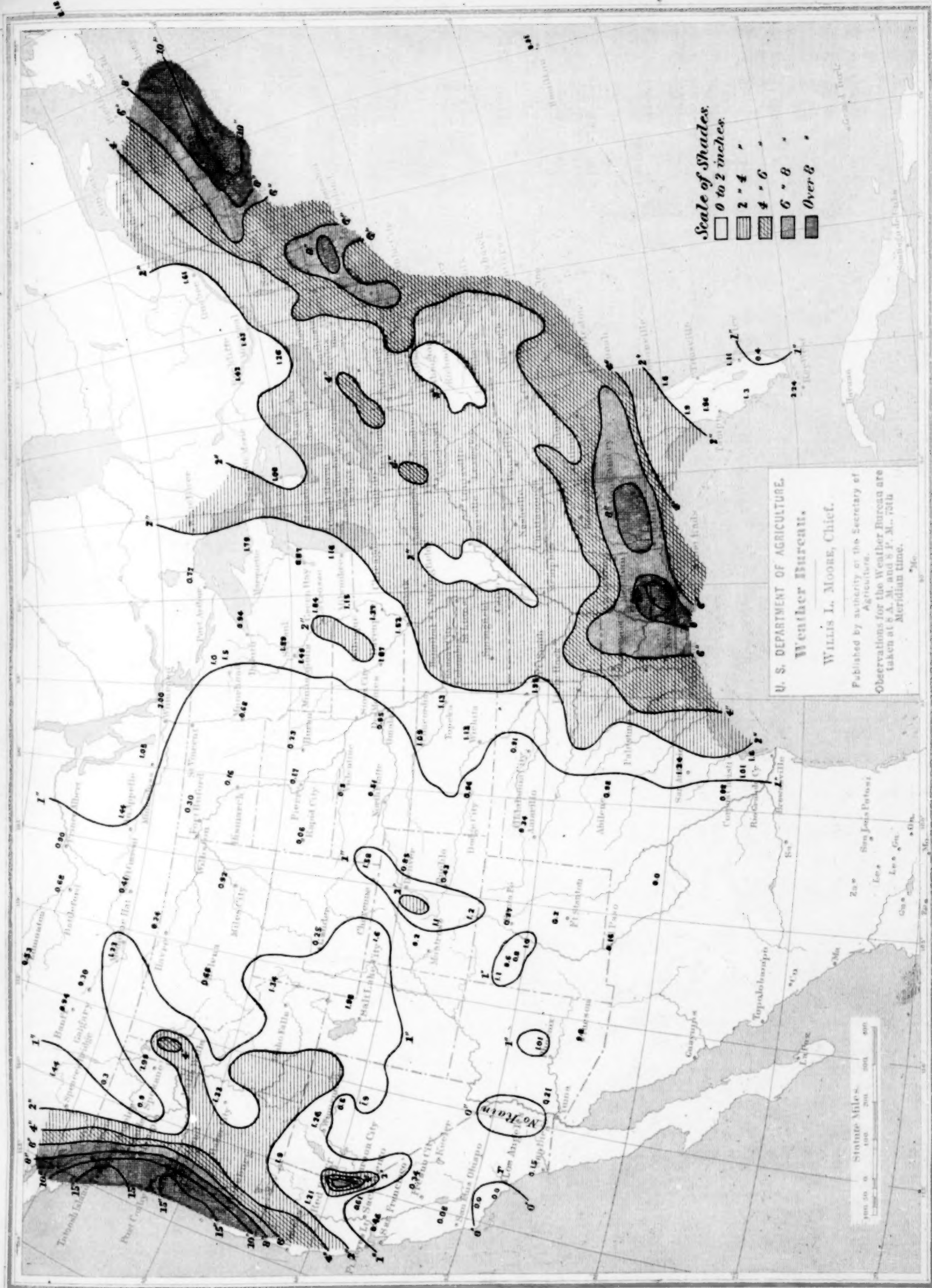


Chart IV. Sea-Level Pressure and Temperature and Resultant Surface Winds. November, 1896.

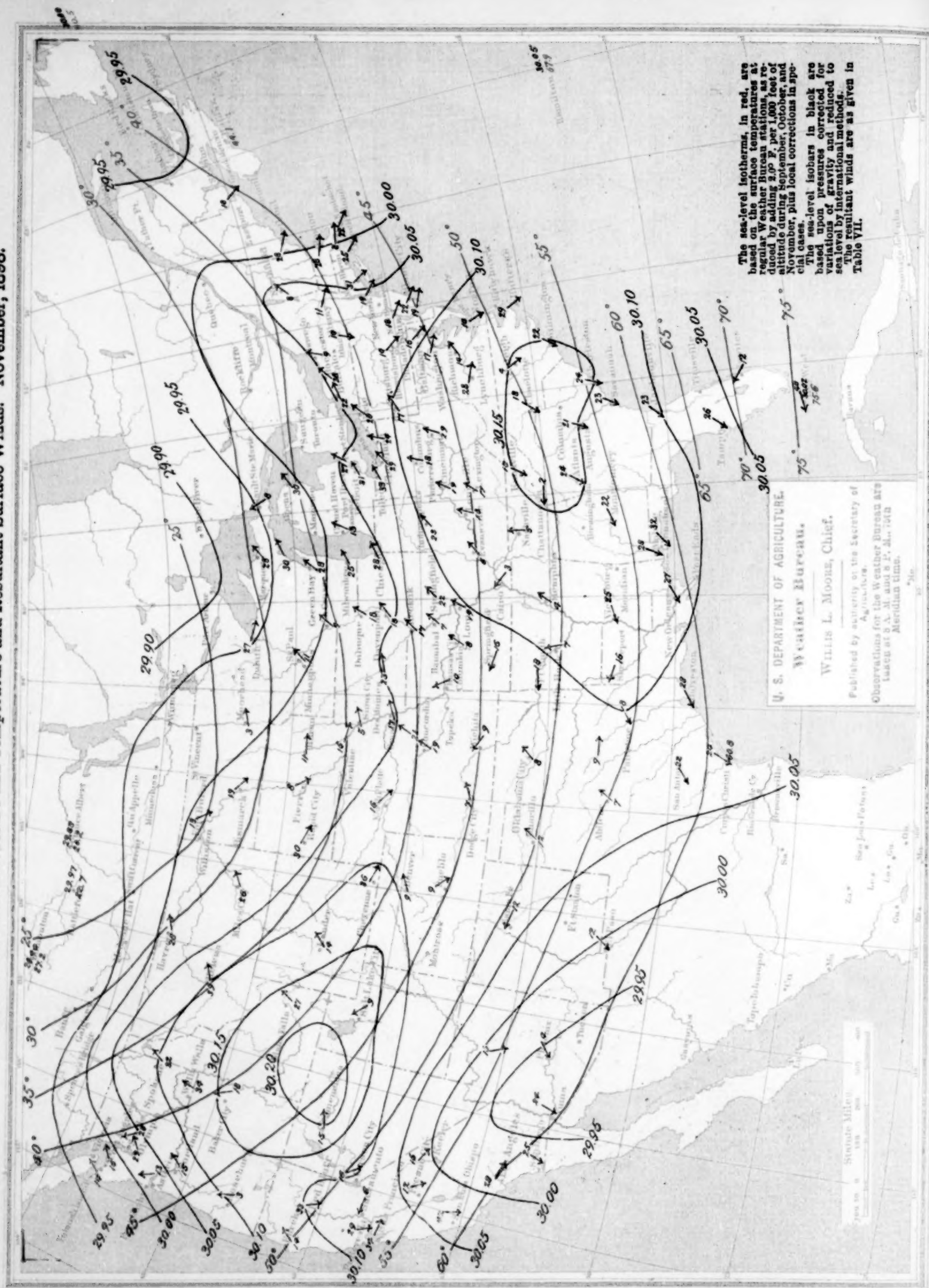


Chart V. Hydrographs for Seven Principal Rivers of the United States. November, 1898.

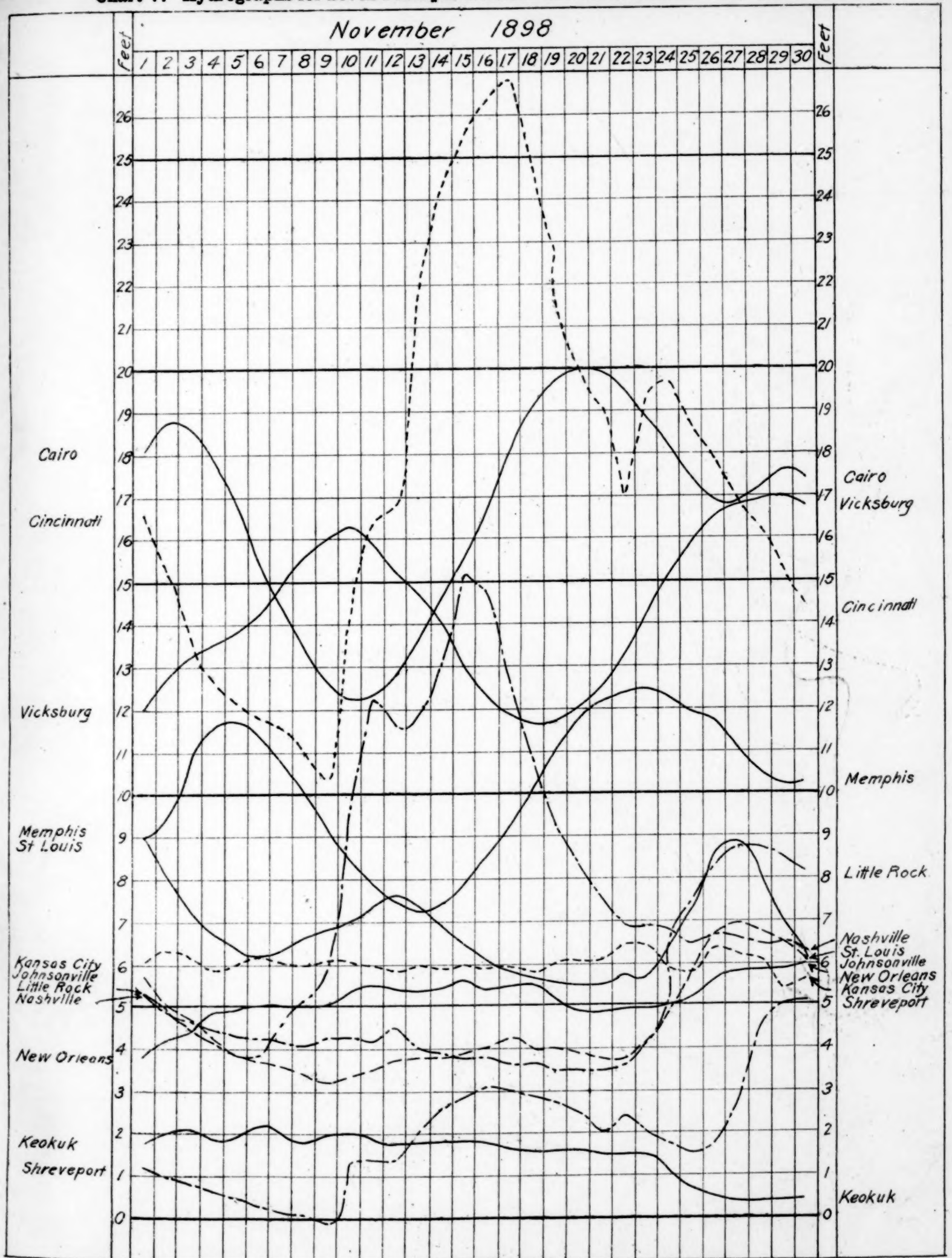


Chart VI. Surface Temperatures; Maximum, Minimum, and Mean. November, 1898.

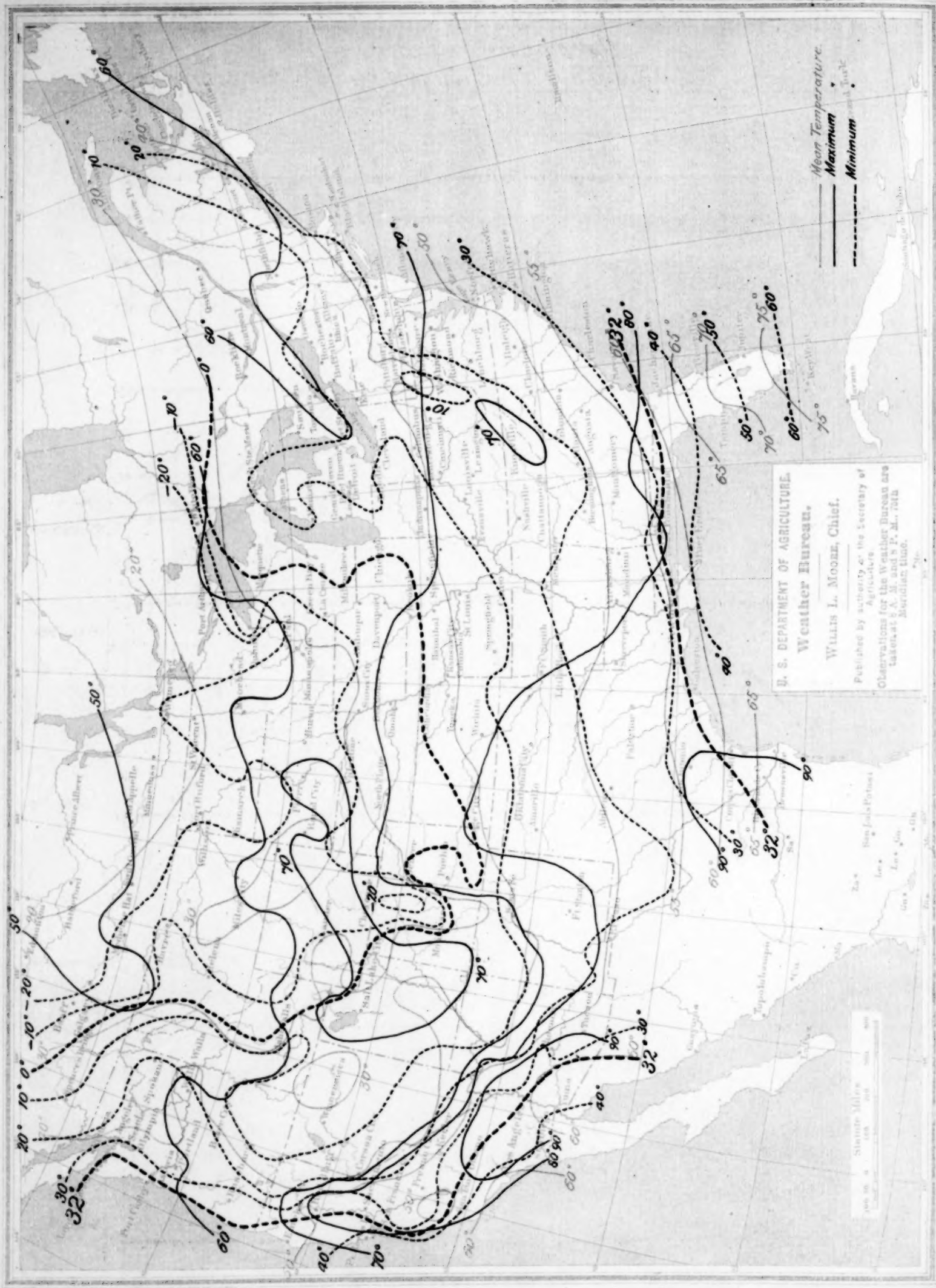


Chart VII. Percentage of Sunshine. November, 1898.

Chart VII. Percentage of Sunshine. November, 1898.



Chart VIII. Total Snowfall. November, 1898.



Chart IX. Snow on ground at end of month. November, 1898.

Chart IX. Snow on ground at end of month. November, 1898.

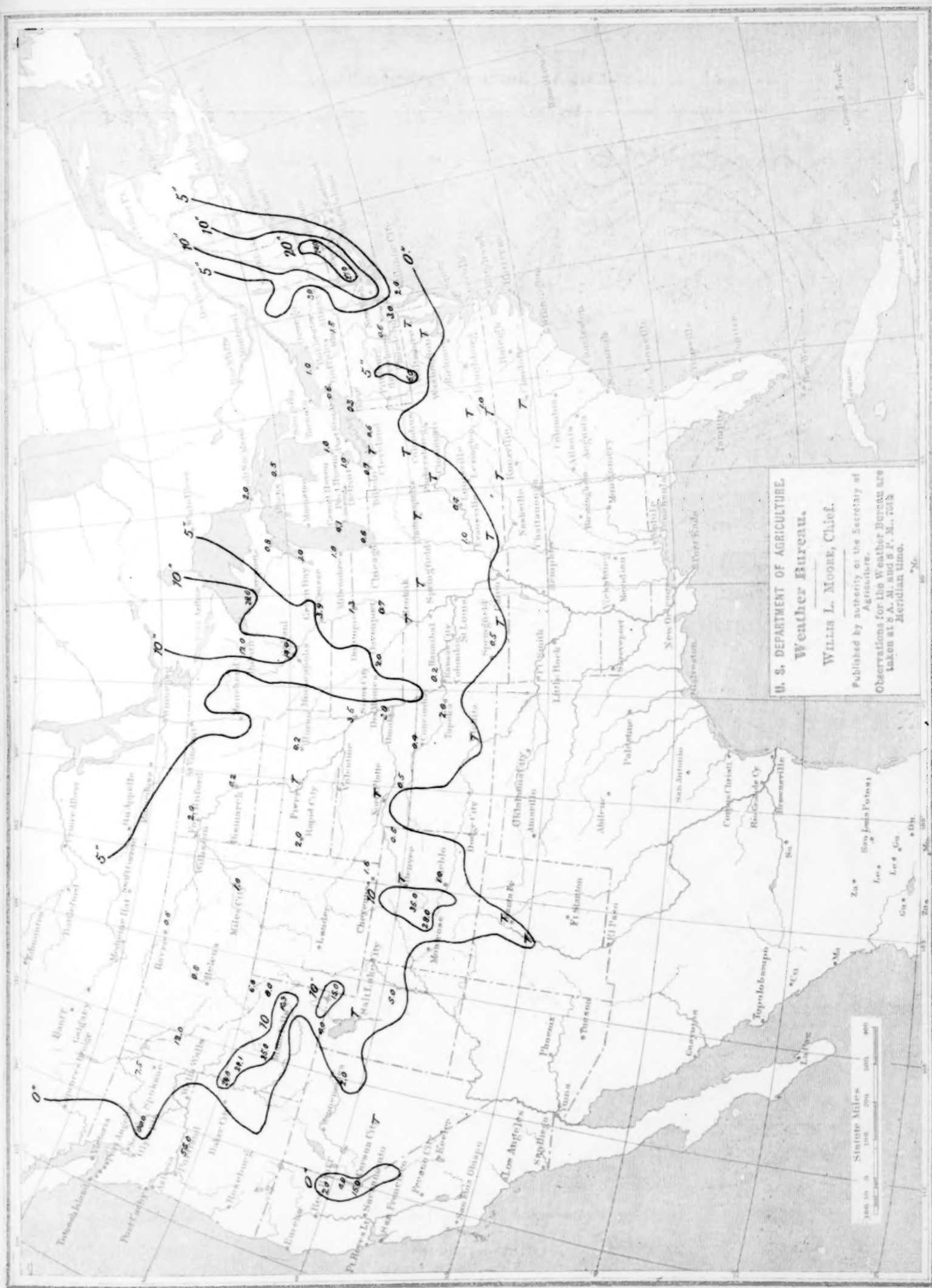
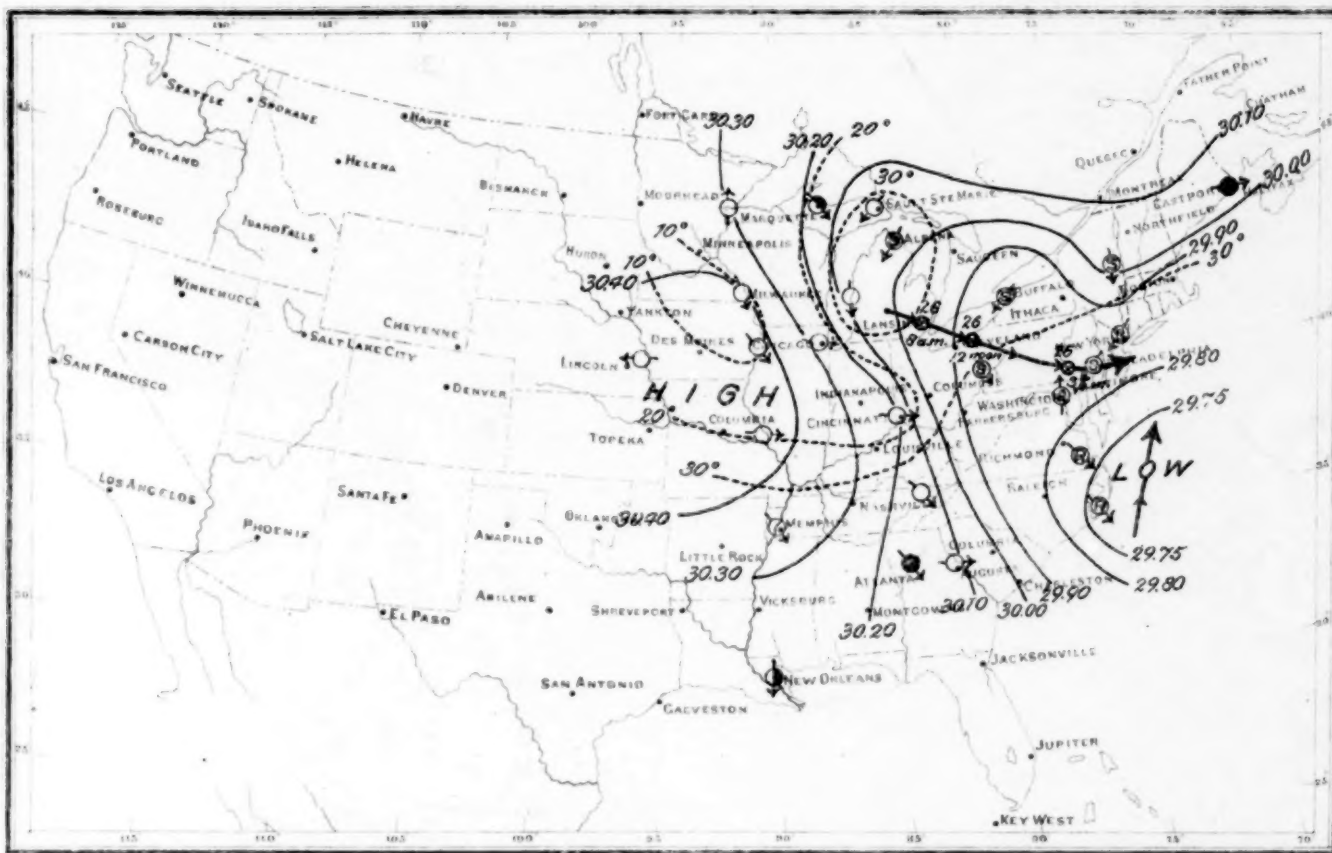


Chart XI. Storm of November 26, 1898.

(a) 3 p. m.



(b) 8 p. m.

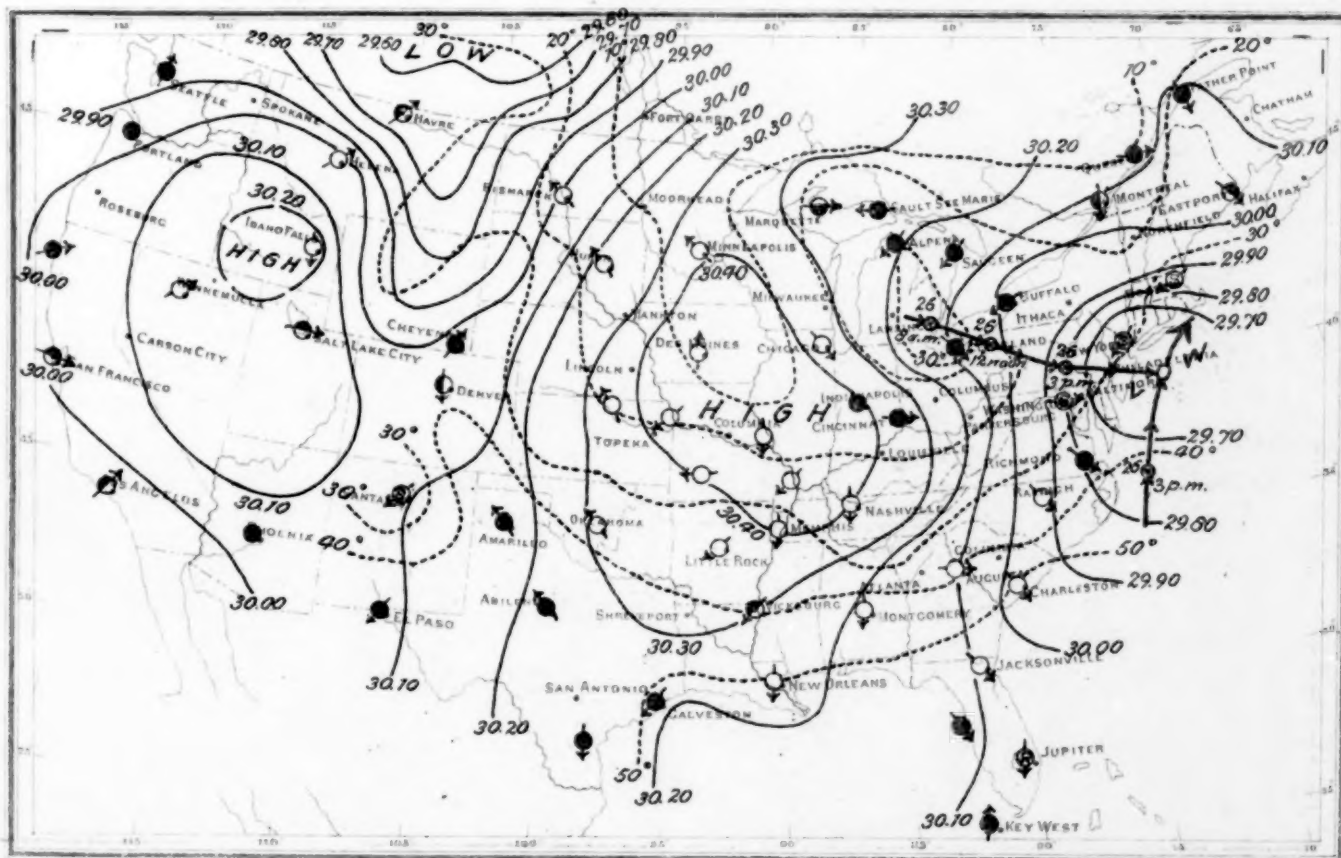
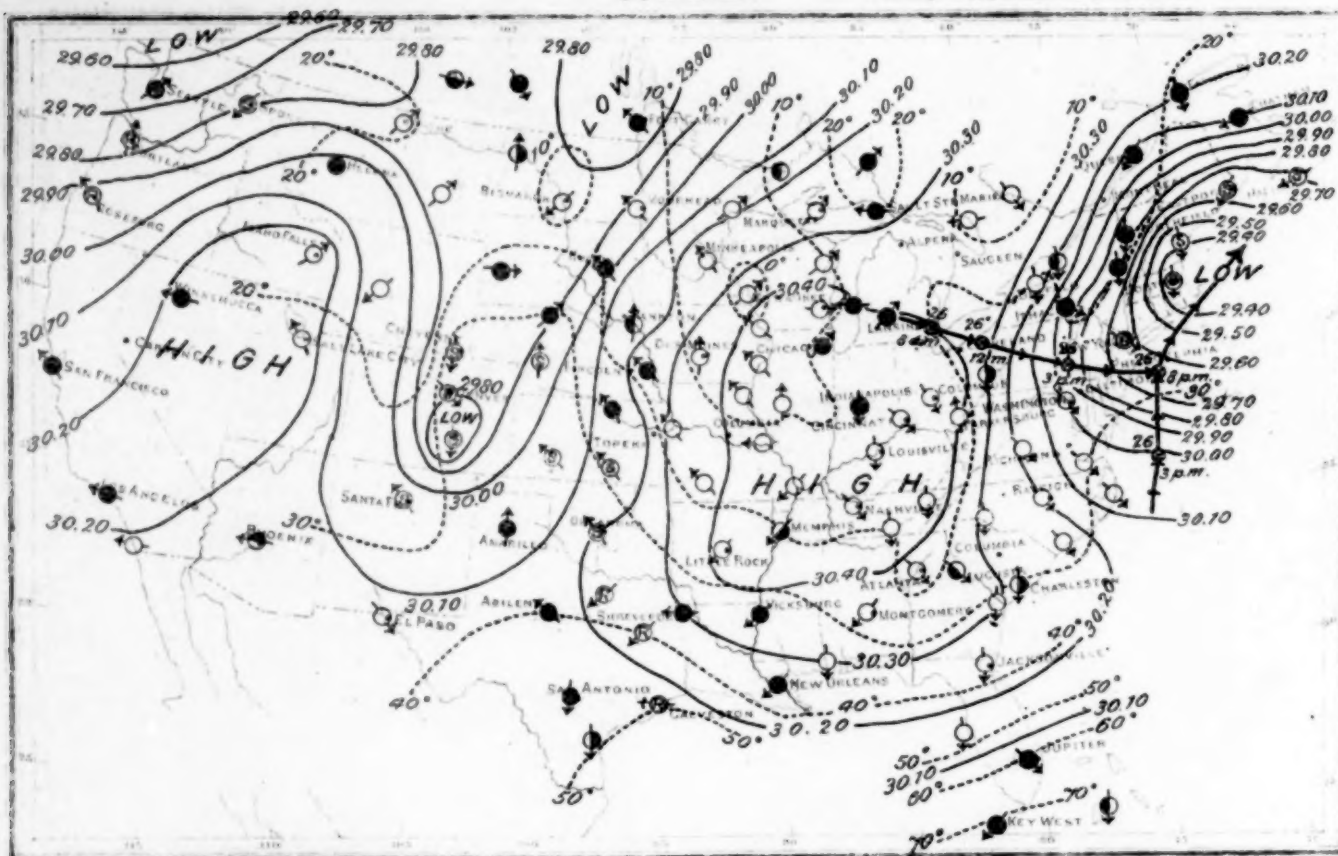


Chart XII. Storm of November 27, 1898.

(a) 8 a. m.



(b) 8 p. m.

